

06

EPIC

Site Option



6.0 EPIC Site

The EPIC site has been assessed at a precinct level, where three potential stadium locations have been considered within the EPIC precinct, see Figure 19.

The precinct is located 6km north of the Canberra city central business district, in an identified rural land release area of Kenny, in East Gungahlin. The precinct adjoins the suburbs of Mitchell, Harrison and Watson, which are largely low density residential, and mixed-use industrial use (typically 1-2 storeys in height). The Canberra Showground is located within the precinct and Canberra Thoroughbred Park is located to the west. Its proximity to the main arterial road into and out of Canberra – the Federal Highway, positions the precinct in a prominent location with clear sightlines to the three site options and direct vehicular access, however this also severs the precinct's connectivity to suburbs to the south.

Although all three site options have been considered, the ACT Government selected Location B for the purposes of the preliminary technical analysis within the study. This location was chosen for the purpose of this study due to its proximity to the EPIC and Racecourse light rail stop and the future Sandford Street light rail stop. The location also avoids the ACT grassland habitat at Location A and the Hoary Sunray offset area near Location C, however, would require the relocation of the harness training track and associated facilities. This site would also require detailed consideration of Sullivan's Creek flooding characteristics.



Figure 19: EPIC Precinct and Stadium Location Options

6.1 Planning and urban design

6.1.1 Planning controls

In order of precedence, the planning requirements for this site are governed by:

- National Capital Plan 2016 (National Capital Authority)
- Territory Plan 2008 (ACT Government)

6.1.1.1 National Capital Plan (NCP)

The National Capital Plan applies designated areas which include key approach routes into Canberra such as the Federal Highway.

The objective in the NCP is to emphasise the national significance of the main approach routes and avenues, thus heightening the traveller's first perception of approach and arrival. This includes building up expectations by progressively formalising the design character as travellers approach the Central National Area, enhancing views to recognisable and popular images of the National Capital to further build expectation and define the approach.

Accordingly, height restrictions of 8.5m apply within 200m of the Federal Highway.

6.1.1.2 Territory Plan

The precinct is within the Gungahlin District Precinct Code. Minimal planning policies are provided for this site,

presenting an opportunity to frame how the development of this area could be achieved in the future. Note should be made to the urban boundaries in the Gungahlin District in relation to this precinct, and its relationship with the Gungahlin Strategic Assessment Biodiversity Plan (Biodiversity Plan) 2013. This is in regard to assessing the potential impact from development in the remaining greenfield site in Gungahlin.

Additionally, the EPIC precinct is included in the Structure Plan East Gungahlin (2014). Under this Plan, key general planning principles and policies pertinent to this review include:

- Encourage a mix of land uses
- To maintain and enhance natural systems and protect key natural areas
- To encourage development that is ecologically sustainable, and minimise pollution through design and technology of stormwater, wastewater, sewerage, traffic and other systems
- To create a landscape pattern that brings the open space network close to all urban development, providing access and amenity, and that correlates closely with the broader natural landscape setting

Specific policies to the EPIC precinct (Section 1.2.2 Kenny and part Harrison) include:

- Existing drainage lines to contribute to

linear park.

- Cultural and / or natural heritage sites are to be preserved within open space and provide a pedestrian/cycling underpass to urban areas of Kenny east of Horse Park Drive.
- Cycleway/pedestrian link to be provided within open space.
- Well Station Road (trail) and adjacent trees to be retained in open space.

6.1.2 Urban design and public domain

Located 8 km from the city core, this precinct has limited existing street activation nearby. The semi-rural and residential character of the immediate surrounds provides limited ability for significant levels of future pre and post event activation (i.e. through the presence of supporting food and beverage outlets, etc.). However, the flexibility in design and development of this precinct presents an opportunity to integrate such offerings if developed as part of a broader mixed-use precinct. Moreover, due to its semi-rural location, the precinct is in close proximity to a number of existing parks, nature reserves, and water bodies and this can present unique opportunities to develop new recreational resources within the precinct, and as part of a broader master-plan response for the area.

Additional opportunities and considerations include:

- Due to a lack of density in surrounding areas, opportunities for 'non-event mode' are limited. This includes using the stadium for other functions and by different community and business groups. As identified above, due to the undeveloped nature of this precinct, there may be an opportunity to integrate other business types and community functions in a broader masterplan response to support the demand for 'non-event mode' use of the stadium.
- Given the largely rural and low-density residential surrounds, a new prominent landmark development in the landscape will need to consider potential landscape and visual impacts to sensitive receptors.
- There are currently no adjoining public spaces and areas of vegetation, and tree canopy cover are limited, however the design could connect to nearby Crace Grasslands Nature Reserve, and Crace Hill - located 500m-1km west of the precinct fronting Flemington Road.

See also Figure 20.



Figure 20: Urban Design and Planning – EPIC

6.1.3 Strategic Planning

There are a number of supporting industries near the EPIC precinct, including media and technology broadcasting. These could support the growth and development of a mixed-use / sports hub associated with a new stadium.

There is the opportunity for the stadium development to be a catalyst. A stadium in this location could support the development of the existing adjoining Canberra Showground and Thoroughbred Park and form a larger precinct. It may have the capacity to reinforce an identity for this area, with greater ability to 'control' the design of this precinct.

Community push back has been noted in relation to the broader land release strategy for Kenny – citing the development of natural setting in outlying city areas. As such sensitivity to the treatment of landscape and design layout of the facility needs to be integrated into the design.

See also Figure 20.

6.1.4 Connectivity – Vehicle and Active travel

The precinct currently lacks active transport modes, with large areas allocated to parking and prioritising connections via car and taxi.

Indirect links to public transport exist via EPIC and Racecourse light rail stop. However, a lack of existing pedestrian access paths would require an additional network of footpaths to be provided to allow comfortable and safe access to the stadium. Access to the stadium within this precinct may also require connections to additional transport modes (e.g. new bus routes to transport spectators to and from the city).

There is a lack of existing cycle infrastructure to link the precinct to the wider cycle network, although the 'Future City – Gungahlin via Dickson' cycle route has been endorsed and would see a new cycle link along Flemington Road.

Additional opportunities and considerations:

- The development block scale and relatively undeveloped streetscape / roadways may enable flexibility and greater control over the design of separating vehicular and pedestrian access into the precinct, including the

reticulation of driveways and access points.

- The precinct is bounded by the Federal Highway which severs its connection to surrounding suburbs to the south.
- Being easily accessed off the Federal Highway provides easy vehicular access for both services (deliveries, etc.) as well as car access.

See also Figure 21.

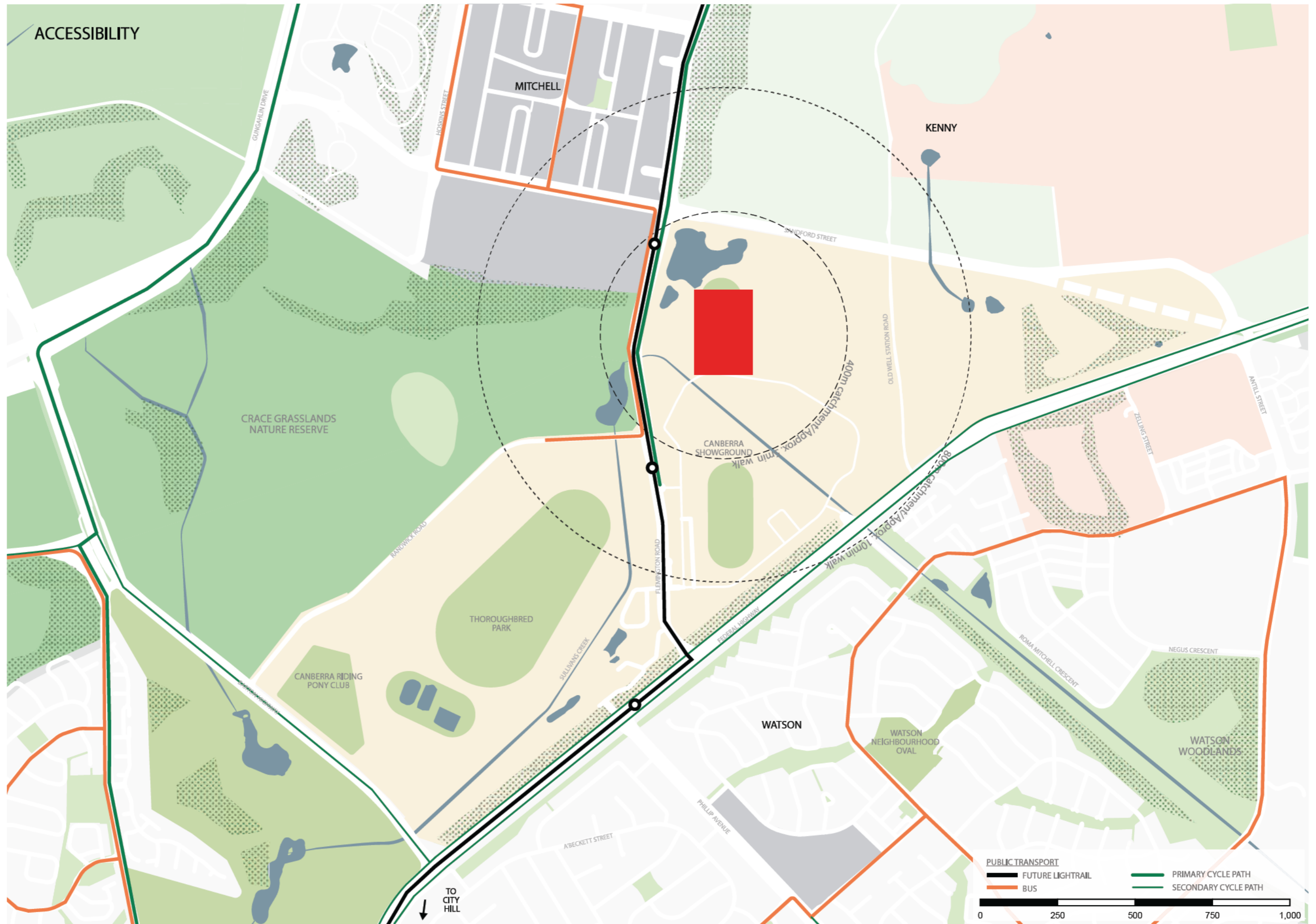


Figure 21: Access and Movement – EPIC

6.1.5 Sustainability

Microclimate needs to be addressed. This area is identified as one of the 'hotspots' for urban heat in Canberra. The local context has a general lack of existing tree canopy around the site and exposed location. Prevailing winds are from the north west.

Given the largely undeveloped land and its site size, there is an opportunity to explore the creations of new open spaces and tree planting as a key component to any future stadium development. As a result of its proximity to existing water courses and nature reserves, a landscape led masterplan could deliver valuable spaces for recreation, significant amounts of tree canopy, a sustainable approach to water management, as well new biodiversity corridors and lower operational costs for the development.

Potential sensitivity on how to develop largely rural lands and mitigate any impacts upon adjoining water courses and nature reserves.

See also Figure 22.

6.1.6 Planning and urban design Summary

Table 10 provides a summary of planning considerations for the EPIC precinct.

Planning
Development must be sympathetic to, and not be discordant with, the landscape setting.
Current permitted land use allows for an 'outdoor recreational facility' and as such permission for use as a stadium needs to be investigated.
Assesses the potential impact from the development as one of the remaining greenfield sites in Gungahlin.
Note the natural setting and ensure any development is ecologically sustainable, to minimise pollution through design and technology of stormwater, wastewater, sewerage, traffic and other systems.
Community push back has been noted in relation to the broader land release strategy in this area (Kenny).
Urban Design
Currently lacks a variety of and easy access to active transport modes.
Area is identified as one of the 'hotspots' for urban heat in Canberra.
Development of largely rural lands will need to mitigate any impacts upon adjoining water courses and nature reserves.

Table 10: EPIC Site Planning Summary

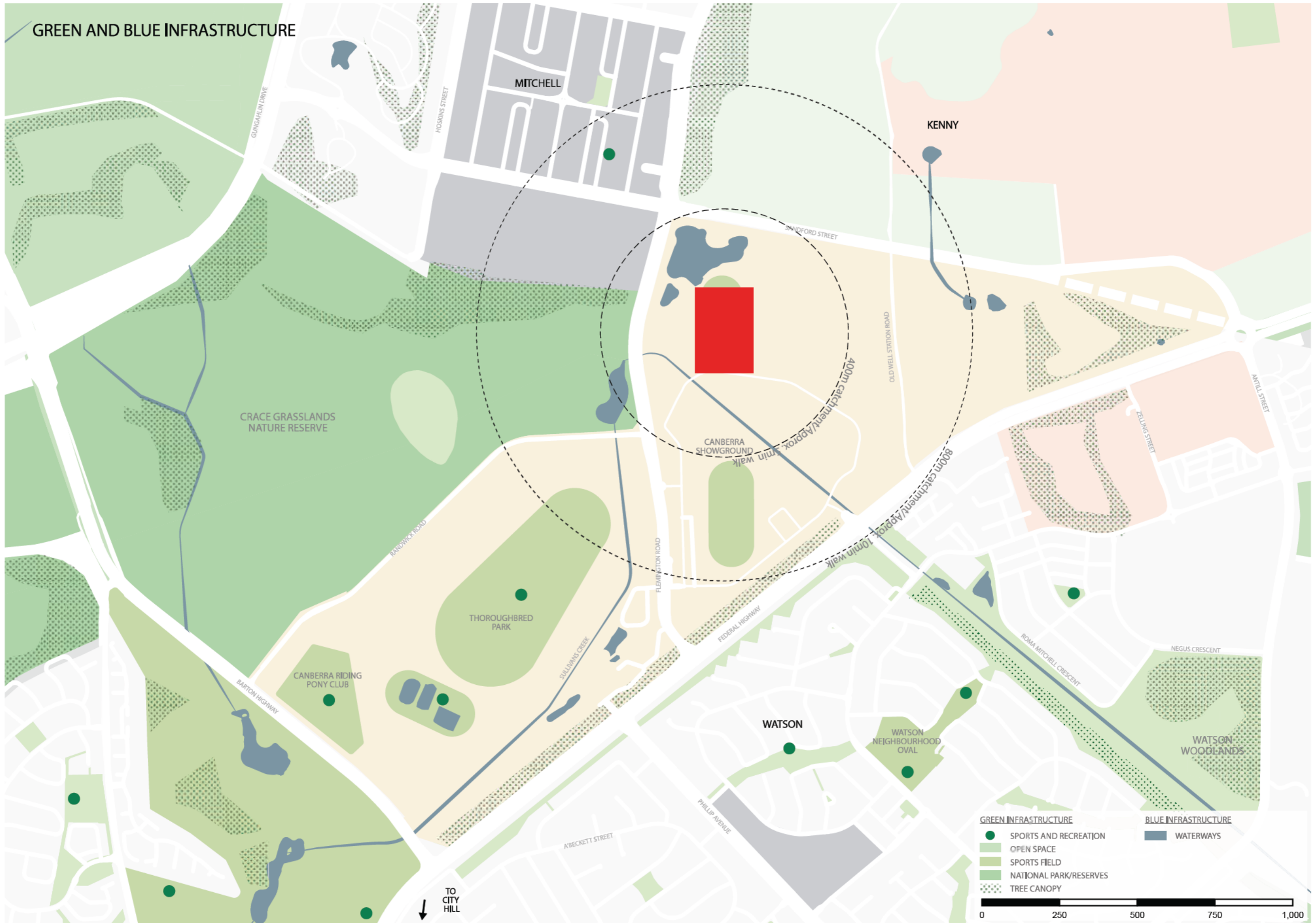


Figure 22: Open space, sustainability and green and blue infrastructure – EPIC Site

6.2 Environmental

6.2.1 Land zoning

The EPIC precinct encompasses four blocks, all are zoned as Broadacre (NUZ1) or Transport (TSZ1), see Figure 23.

The objectives of the zone NUZ1 are:

- a) Make provision in a predominantly rural landscape setting for a range of uses which require larger sites and/or a location outside urban areas
- b) Make provision for activities requiring clearance zones or protection from conflicting development
- c) Ensure that development does not adversely impact or visually intrude on the landscape and environmental quality of the locality
- d) Ensure, where appropriate, that development and the use of land does not undermine the future use of land which may be required for urban and other purposes.

The objectives of the zone TSZ1 are:

- a) Make provision for a transport network that can provide for the efficient, safe and convenient movement of people and goods
- b) Ensure that major roads, light rail and transport infrastructure are developed in a comprehensive manner, including the provision of appropriate landscaping, street furniture and lighting, traffic control devices, and noise attenuation measures
- c) Provide for active travel and public transport.



Figure 23: Land Zones – EPIC Precinct

6.2.2 Land custodianship

Table 11 details the Land Custodianship for each block and section.

Block 6 section 72	Block 464	Block 765	Block 864
1 Territory Plan - Land Use Zone: NUZ1: BROADACRE	Territory Plan - Land Use Zone: NUZ1: BROADACRE	Territory Plan - Land Use Zone: NUZ1: BROADACRE	Territory Plan - Land Use Zone: NUZ1: BROADACRE TSZ1: TRANSPORT
Territory Plan - Overlay Zone: N/A	Territory Plan - Overlay Zone: N/A	Territory Plan - Overlay Zone: N/A	Territory Plan - Overlay Zone: N/A
Plan Nos. AP7121, POL4900, X20835, DP11369	Plan Nos. AP4062, POL4172, X20792, DP11366	Plan Nos. AP6176, POL4900, X18475, DP10842	Plan Nos. AP7487, POL4900
Block Area: 224,578m ²	Block Area: 181,616m ²	Block Area: 299,171m ²	Block Area: 105,074m ²
District Name - CANBERRA CENTRAL	District Name - GUNGAHLIN	District Name - GUNGAHLIN	District Name - GUNGAHLIN
Division Name - LYNEHAM	Division Name - N/A	Division Name - N/A	Division Name - N/A
Section Number - 72	Section Number -	Section Number -	Section Number -
Block Number - 6	Block Number - 464	Block Number - 765	Block Number - 864
Addresses - 10 FLEMINGTON ROAD	Addresses - FEDERAL HIGHWAY	Addresses - 50 MORISSET ROAD	Addresses - N/A
Current Lifecycle Stage - REGISTERED	Current Lifecycle Stage - REGISTERED	Current Lifecycle Stage - REGISTERED	Current Lifecycle Stage - APPROVED
Land Use Policies: NUZ1: BROADACRE	Land Use Policies: NUZ1: BROADACRE	Land Use Policies: NUZ1: BROADACRE	Land Use Policies: NUZ1: BROADACRE TSZ1: TRANSPORT

Table 11: Land Custodianship Details - EPIC Site

6.2.3 Biodiversity

Adopting the same approach as the Civic Pool site, a search was conducted using the ACTmapi – Significant Species, Vegetation Communities and Registered Trees. Table 12 summarises the presence of each category at or near the EPIC precinct.

Table legend	Not present or near	Present or near
--------------	---------------------	-----------------

Data Description	Location A	Location B	Location C
Aquatic & Fish	Present or near	Present or near	Present or near
Amphibians	Present or near	Present or near	Present or near
Mammals	Present or near	Present or near	Present or near
Spotted-tail Quoll (<i>Dasyurus maculatus</i>)	Present or near	Present or near	Present or near
Reptiles	Present or near	Present or near	Present or near
Striped Legless Lizard (<i>Delma impar</i>)	Present or near	Present or near	Present or near
Invertebrates	Present or near	Present or near	Present or near
Golden Sun Moth (<i>Synemon plana</i>)	Present or near	Present or near	Present or near
Threatened Plants	Present or near	Present or near	Present or near
Hoary Sunray (<i>Leucochrysum albicans</i>)	Present or near	Present or near	Present or near
Rare & Other Important Plants	Present or near	Present or near	Present or near
Ecological Communities	Present or near	Present or near	Present or near
ACT Important Wetlands	Present or near	Present or near	Present or near
High Country Bogs and Fens	Present or near	Present or near	Present or near
ACT Grassland Communities	Present or near	Present or near	Present or near
Threatened Woodland	Present or near	Present or near	Present or near
Vegetation Communities	Present or near	Present or near	Present or near
Canberra Vegetation Structure Map (CVSM)	Present or near	Present or near	Present or near
Connectivity, Habitat and Restoration	Present or near	Present or near	Present or near
Environmental Offsets	Present or near	Present or near	Present or near
Strategic Assessment Areas	Present or near	Present or near	Present or near
Gungahlin	Present or near	Present or near	Present or near
ACT Tree Register	Present or near	Present or near	Present or near

Table 12: Biodiversity Summary – EPIC Precinct

The EPIC precinct and its surrounds is home to several sensitive flora and fauna species. Golden Sun Moth and Striped Legless Lizard are potentially present on the north side of Morisset Road and east side of Old Well Station Road, within 50m but outside of the EPIC precinct. The north-west corner of the EPIC precinct may hold Spotted-tailed Quoll, refer to

Figure 24. The precinct also intersects with the Connectivity, Core Habitat and Restoration Tools and comprises ACT grassland habitat covering stadium location A.

It is recommended that a biodiversity assessment is undertaken as part of future studies to identify any potential

risk the proposed development poses to biodiversity or habitat identified as being present and near to the site. This might include conducting an ecology survey to determine the presence and extent of the Golden Sun Moth, Striped Legless Lizard and Spotted-tailed Quoll communities.

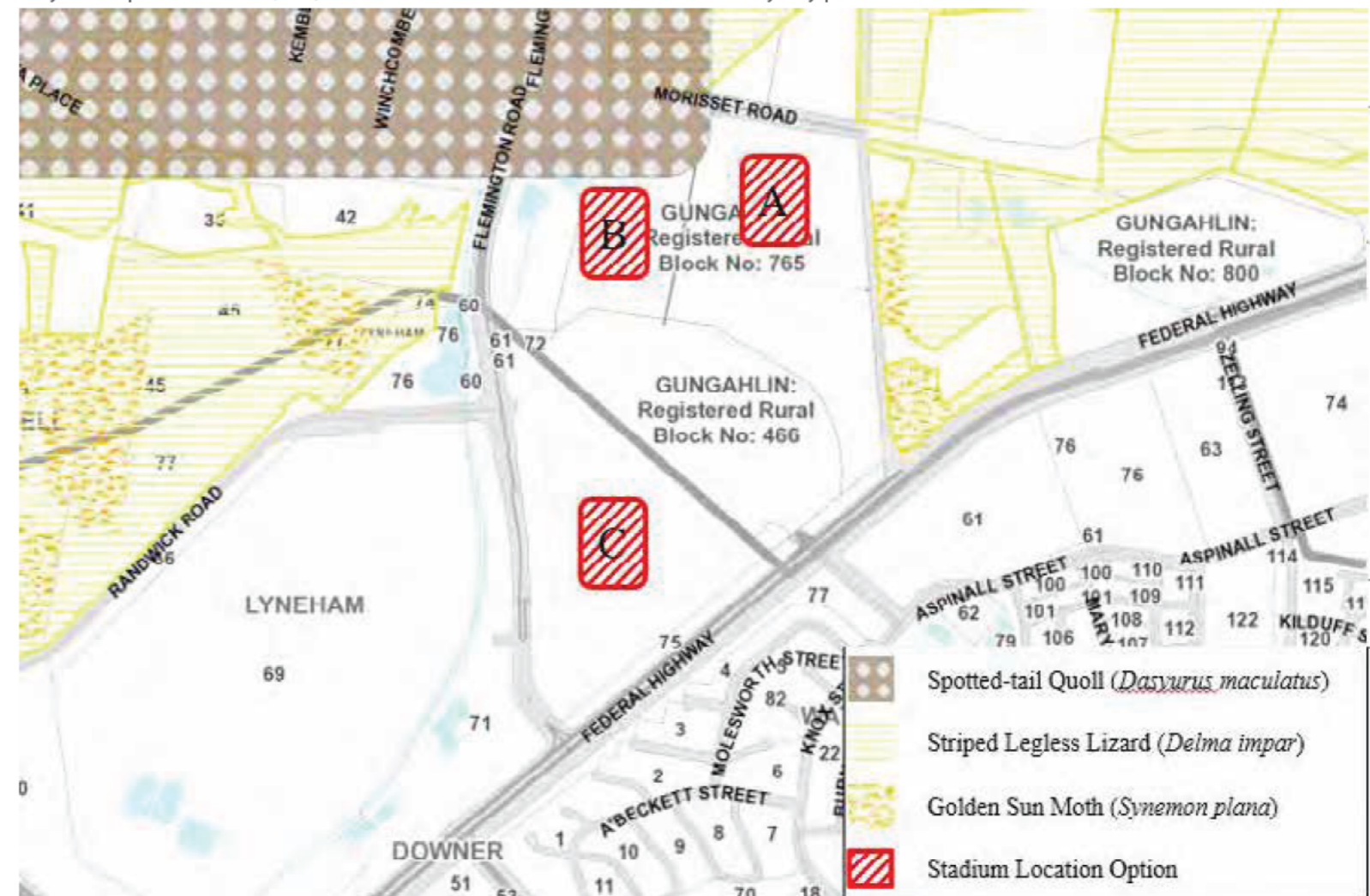


Figure 24: Threatened Species – EPIC Precinct

6.2.4 Contamination

The EPIC precinct does not have any listings on the ACT Register of Contaminated Sites.

6.2.5 Bushfire prone areas (BPA)

The BPA map is a single risk-based map that defines the area of the ACT that has been assessed as being at high risk to life and property due to bushfires. Canberra's built-up areas that are adjacent to forest and grassland are defined as BPAs, as is the ACT's entire rural area. A BPA extends around the northern section of the EPIC precinct, along the inside of Old Well Station Road, Morisset Road and parts of Flemington Road, see Figure 25.

6.2.6 Bushfire Abatement Zone

Under the Emergencies Act, the Commissioner has declared a Bushfire Abatement Zone (BAZ). The BAZ surrounds Canberra and extends west towards the Murrumbidgee River. It has been developed to identify rural areas where specific measures are required to reduce risk to life and property in the built-up area of Canberra from fires originating or occurring in the BAZ. The EPIC precinct is not within the BAZ, however BAZ's are located in the areas outside of Flemington Road, Morisset Road and Old Well Station Road, see Figure 25.

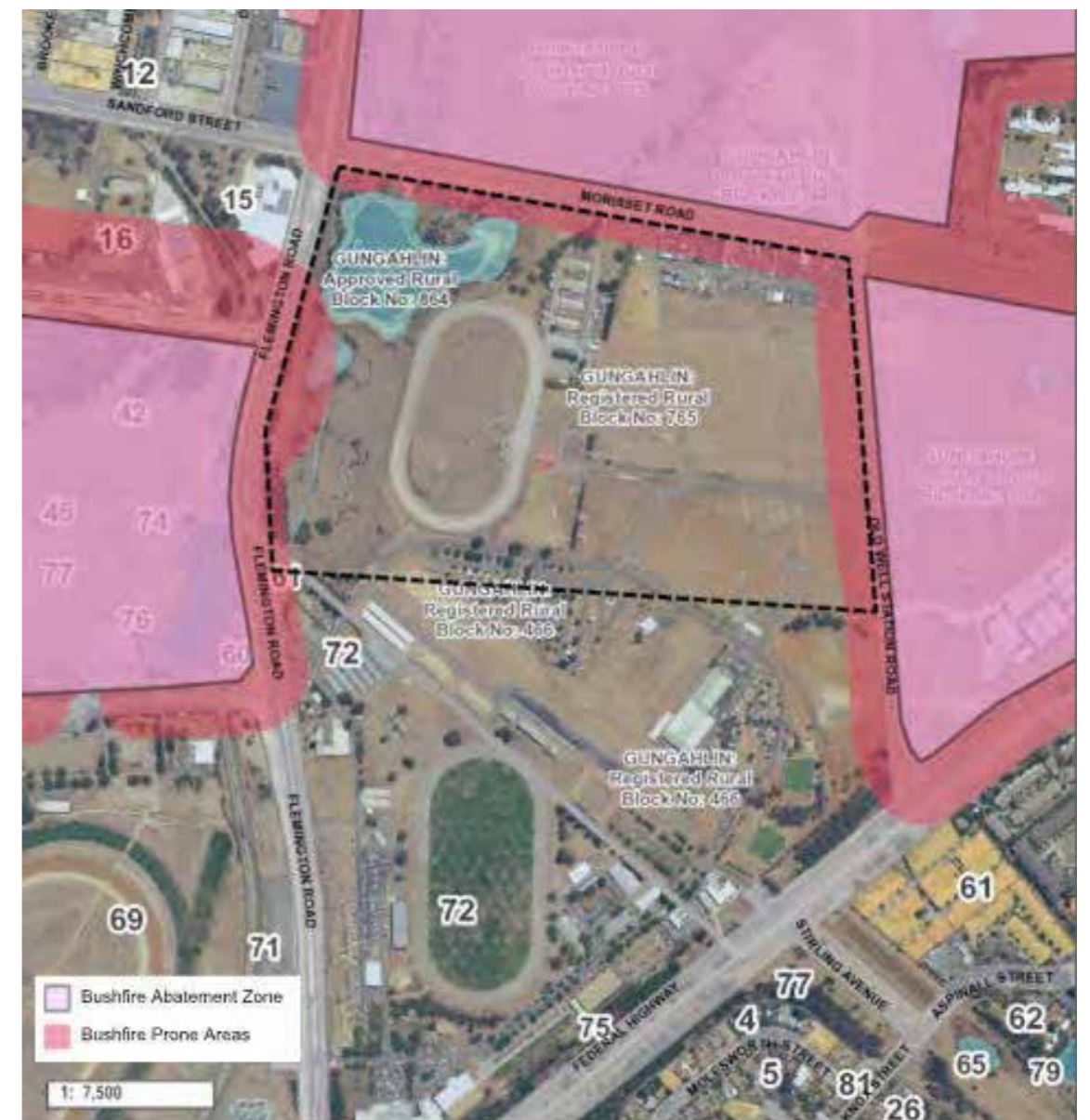


Figure 25: Bushfire Risk – EPIC Precinct

6.2.7 Heritage

6.2.7.1 Aboriginal heritage

See Section 5.2.6.1 for a background definition of Aboriginal heritage

An indigenous heritage assessment including consultation with local indigenous communities should be undertaken during future stages of the project to determine if there are any sites of significances located within the vicinity of the EPIC precinct.

6.2.7.2 Natural and historic heritage

See Section 5.2.6.2 for a background definition of natural and historic heritage.

Within the EPIC precinct, there are no places registered on the ACT Heritage Register that are considered significant. The Federal Highway/Northbourne Avenue is within the NCA planning control to preserve the vista along this boulevard. Requirements pertaining to visual

Item	Description / Limitation
Territory Plan Zone	Broadacre (NUZ1)
Description	Land (other than land in the city centre, town centres and group centres) in a restricted access recreation zone (PRZ2), a broadacre zone (NUZ1)
Noise Zone	Zone E
Noise Limit - Day	50 dB(A) Monday-Saturday 7am-10pm Sunday and Public Holidays 8am-10pm
Noise Limit - Night	40 dB(A) Monday-Saturday 10pm-7am Sunday and Public Holidays 10pm-8am

Table 13: Noise Zone – EPIC Precinct

heritage are discussed in Section 6.1.1.1.

6.2.8 Noise

The ACT is divided into four noise zones; Civic & Town Centres, Group Centres, Local Centres and Residential Areas. The EPIC precinct is located in the Broadacre and recreation areas zone as shown in Figure 26.

The different noise zones set the permissible noise levels (noise standards) which are based on the zoning for each area as outlined in the Territory Plan. Table 13 outlines the noise zone limitations for the EPIC precinct.

Acoustic modelling will be required for the stadium as design is progressed in future stages to determine average and maximum noise generated by various scenarios.

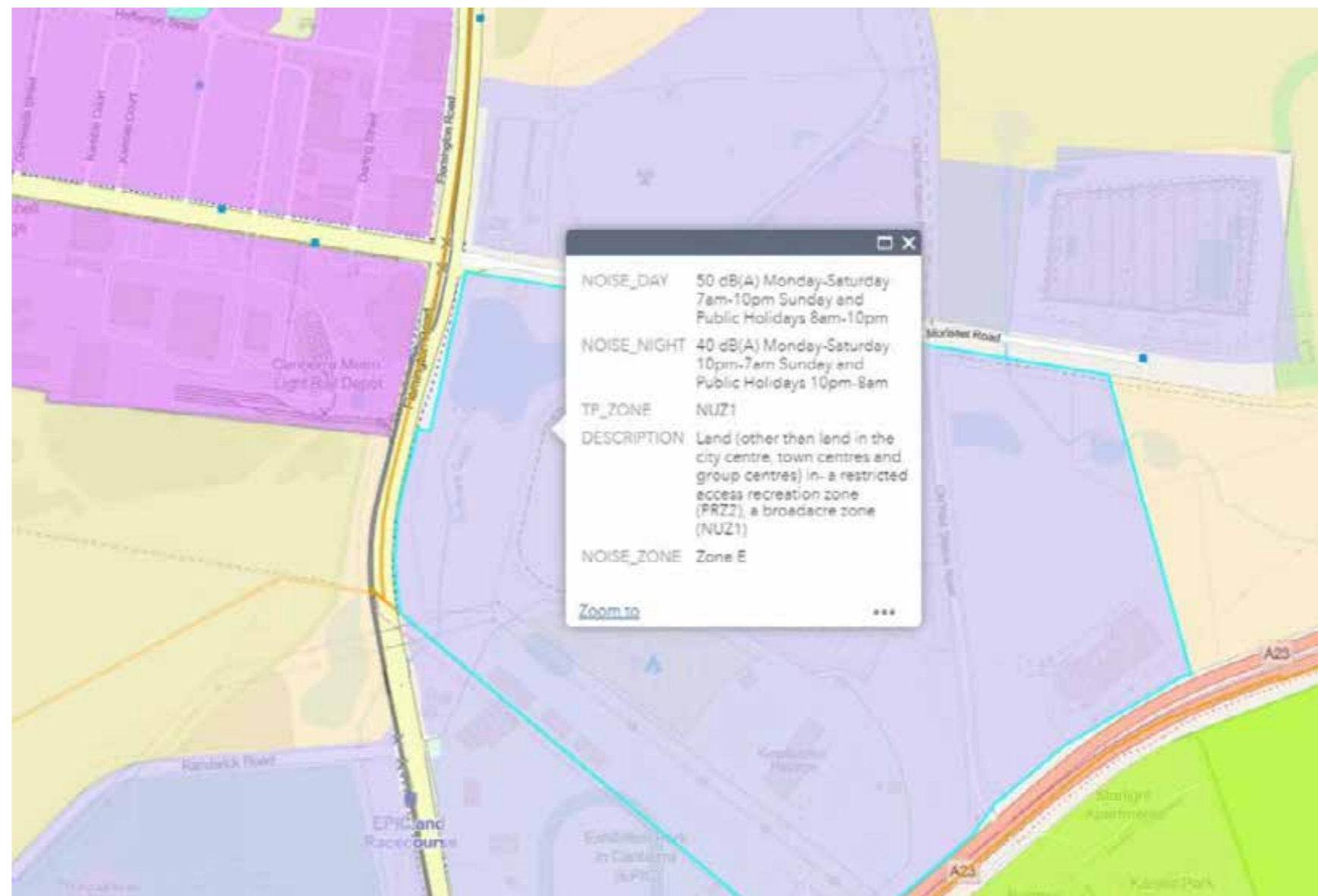


Figure 26: Noise Zone Map – EPIC Precinct

6.2.9 Water and hydrology

Sullivans Creek runs through the north west corner of the precinct where it is controlled by the Flemington Ponds, see Figure 27.

Sullivans Creek is one of eight main water catchments in the ACT. It has experienced minor flooding in 2002, 2010, 2011 and 2012. A major event occurred in 2018 which exceeded a 0.2% AEP event. Post flood event investigations indicated that flood levels across Sullivans Creek appear to have behaved consistently with the predicted 1% AEP flood maps on ACTmapi .

6.2.10 Flooding

According to the 1% Annual Exceedance Probability (AEP) documented on ACTmapi, the extent of flooding is not expected to affect the Civic Pool site, see Figure 28. Site location A and B are nearest to the Sullivans Creek conveyance route and should be carefully planned for future flood events should either of these sites be progressed.

It is recommended that detailed flood modelling is conducted during later stages of the project, findings from such models will likely be required during planning approval processes.



Figure 27: Sullivans Creek

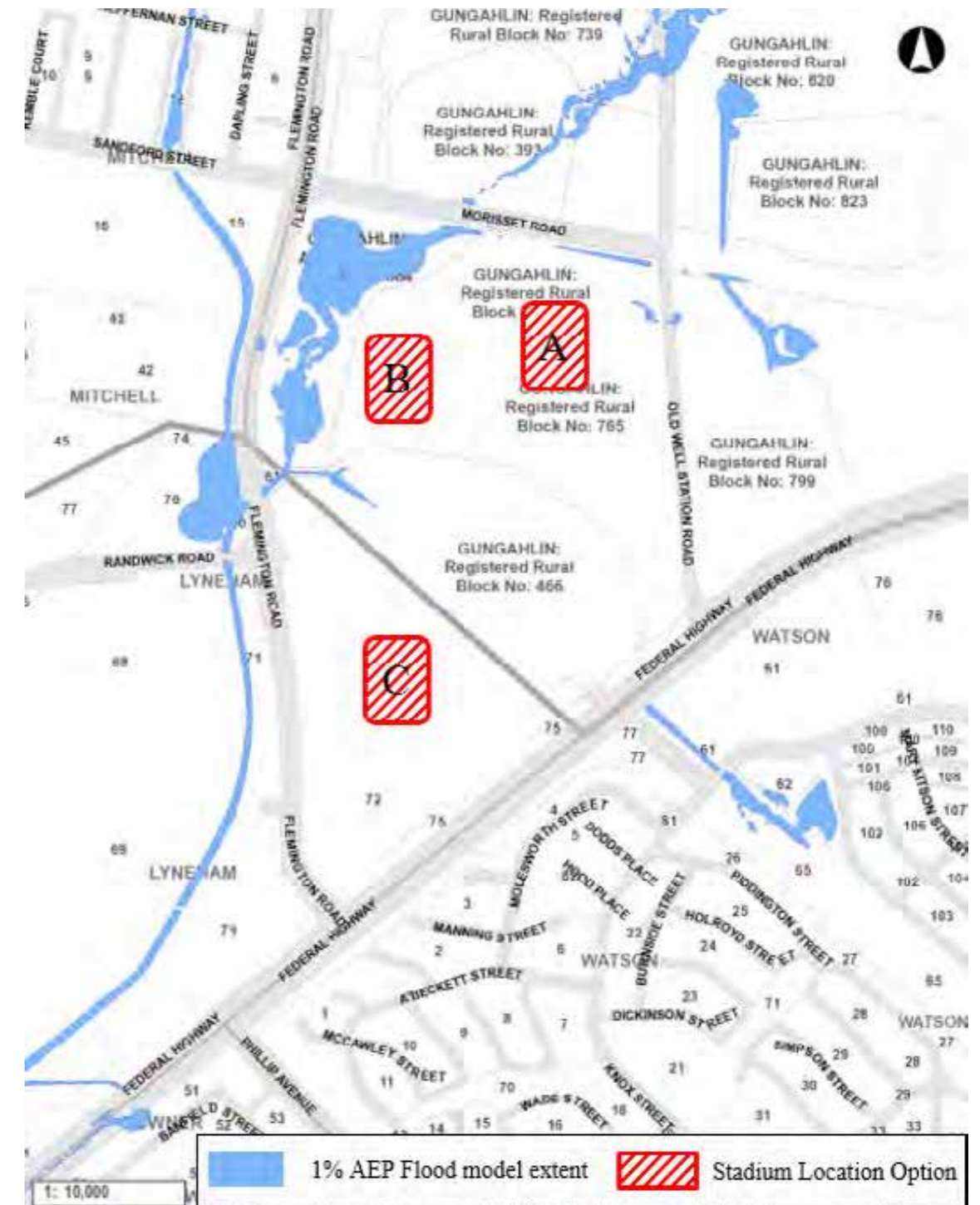


Figure 28: 1% AEP Flood Model Extent (ACT Government) – EPIC Precinct

6.3 Soils and geology

A high-level geotechnical assessment has been carried out for the purpose of identifying geotechnical hazards that may inform or impact design and construction of the stadium. Reference has been made to publicly available geological mapping. No review has been undertaken of site history or historic investigations outside of what is reported on the geological maps. Proposed designs for the stadium options have not been considered in this assessment, as such the advice provided below is generic in nature and not tailored to any specific structural arrangement.

A pond sits in the north-western corner of the site and is fed by Sullivans Creek. A horse racing track occupies the central portion of the site and the western half of the site is occupied by open fields some low-rise structures and a car park. The site covers an approximate area of 447,000m² and sits at an elevation of ~585m AHD.

Reference to the 1:50,000 Geological Map for Canberra indicates the majority of the site is underlain by Alluvium (Qa) associated with Sullivans Creek. The Canberra Formation (Smc) is shown to outcrop in the south-eastern corner of the site and is inferred to underlie the entire site. The Canberra Formation is described as calcareous shale, limestone, sandstone and tuff. Structural measurements indicate the Canberra Formation dips 40° to the south-east. Localised outcrops of volcanic rocks are mapped beyond the site boundary. The

site is indicated to have a low probability of occurrence of acid sulfate soils by CSIRO (2011). The geological map is presented in Appendix A2 and mapped geological units summarised in Table 14.

The site is bound to the north-west and south-east by north-east trending faults. The unnamed fault bounding the site to the north-west is offset by 80m. It is described as a normal fault dipping 65° north-west (Henderson,1981). The second unnamed fault intersects the south-east corner of the site. These are faults are considered inactive, the nearest active feature is the Queanbeyan Fault approximately 11km to the east of site (Clark, 2012).

Assessment of local geological conditions has identified the geohazards presented in Table 15. Note that this list is not exhaustive and additional hazards may be identified following a detailed geotechnical desktop study. A geotechnical investigation comprising a variety of intrusive and non-intrusive techniques would be necessary to quantify the hazards identified in this report along with any additional hazards identified from a detailed desk study.

Unit Symbol	Geological Unit	Unit Age	Description
Qa	Alluvium	Quaternary	Alluvium, Colluvium
Smc	Canberra Formation	Middle Silurian	Calcareous shale, limestone, sandstone and tuff

Table 14: Mapped Geological Units for Epic Stadium option (1:50,000 Geological Map)

Geohazard	Description
High water table	<p>Hazard: Lakes and waterways (Sullivans Creek) observed on site indicates a high-water table.</p> <p>Impact to Project: A high-water table may cause drainage issues and lack of stability during construction phase excavations.</p>
Scour	<p>Hazard: Sullivans Creek could cause progressive scouring of on-site materials, particularly during periods of flood.</p> <p>Impact to Project: If scouring is allowed to progress it could undermine temporary and permanent structures. Consideration should be given to the general arrangement of any future development and how scour might be mitigated.</p>
Quaternary Alluvium	<p>Hazard: Alluvium associated with Sullivans Creek is anticipated to extend across the majority of the site (unless it was removed during historic development). Alluvium can cause issues for foundations such as excessive settlement, and potential for the soil to be loose, soft or liquefiable. An intrusive geotechnical investigation is recommended to delineate the extent of alluvial deposits.</p>
Acid sulfate soils	<p>Hazard: A low probability of potential acid sulfate soils has been identified on site.</p> <p>Impact to Project: Once exposed to oxygen, acid sulfate soils have the potential to break down and create acidic materials which can be harmful to the environment and structures.</p>
Uncontrolled Fill and underground obstructions	<p>Hazard: The site is occupied by an existing horse racing track, a car park and some smaller low-rise buildings associated with the racing track. Some degree of uncontrolled fill may be present on the site owing to the historic development.</p> <p>Impact to Project: Uncontrolled fill is not a suitable bearing stratum for foundations or pavements and would need to either be removed or treated prior to construction. There is also a possibility that underground obstructions associated with historic developments may be present.</p>
Variable Bedrock Conditions	<p>Hazard: Previous investigations undertaken by Arup indicate the Canberra Formation comprises a range of rock types in the project area, including calcareous shale, limestone, sandstone and tuff. Geological mapping indicates the presence of localised volcanic deposits near the site. It is possible that these deposits also encroach on the site as well. Weathering profiles and rock strengths are expected to vary between different material types. Soil profiles are expected to vary between fill, alluvium and residual soils.</p> <p>Impact to Project: The thickness and properties of the soil and bedrock profile is critical to the selection and design of stadium foundation and any permanent or temporary excavations.</p>
Geological Faults	<p>Hazard: Geological mapping indicates that the site is bound by faults to the north-west and south-east. While the fault intersecting the site is not considered active it may be susceptible to future displacement.</p> <p>Impact to Project: These faults may be evidenced by a deeper weathering profile and a possible change in rock type and increase in rock fracturing and rock mass permeability. Active faults have the potential for surface fault rupture hazard generating large fissures and differential movements across the foundation during an earthquake.</p>
Cavernous Limestone	<p>Hazard: The Canberra Formation is described as comprising limestone. Historic works within central Canberra area have encountered voids within the calcareous members of the Canberra Formation.</p> <p>Impact to Project: These are highly anisotropic and can cause decreased strength of the rock mass and increased permeability and can be critical to the design of stadium foundations.</p>

Table 15: Summary of geohazards for Epic Stadium option

6.4 Architectural Concepts

6.4.1 EPIC Bowl Option 1

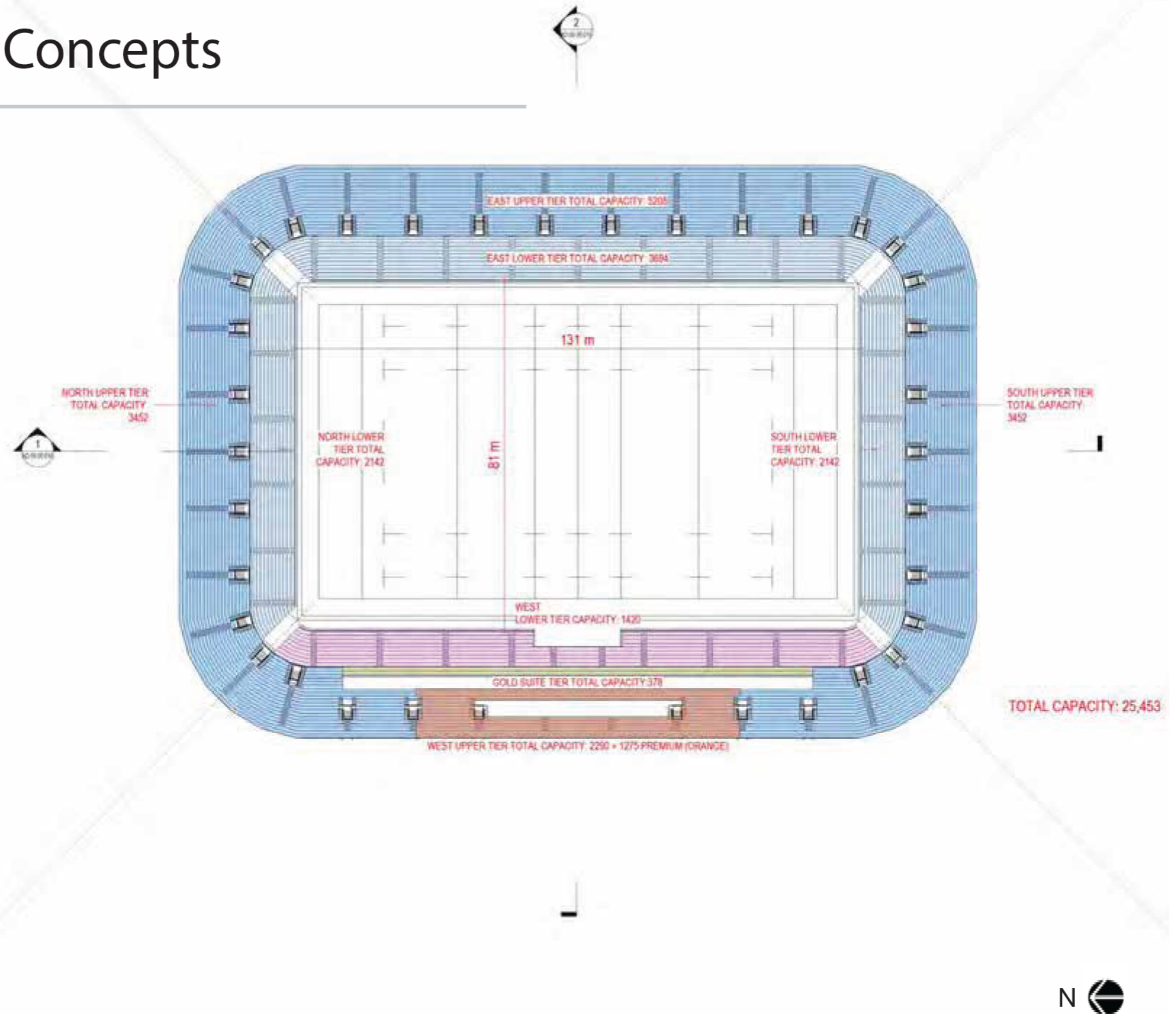
Description

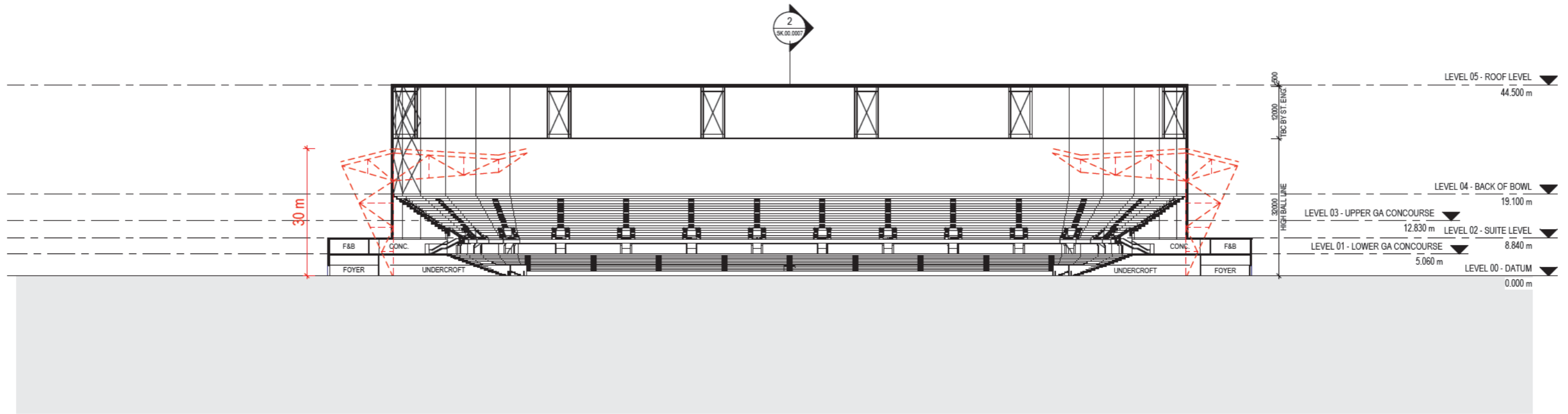
- Continuous 'In-the-round' split tier bowl
- Similar to Bankwest Stadium in appearance
- Lower tier and Upper tiers on all 4 sides with all premium seating located on the long western side of the F.o.P.
- Premium seating located in the lower tier, a dedicated suite tier and upper tier
- Media facilities located at the back of the upper tier on the western side on a dedicated level.

Analysis

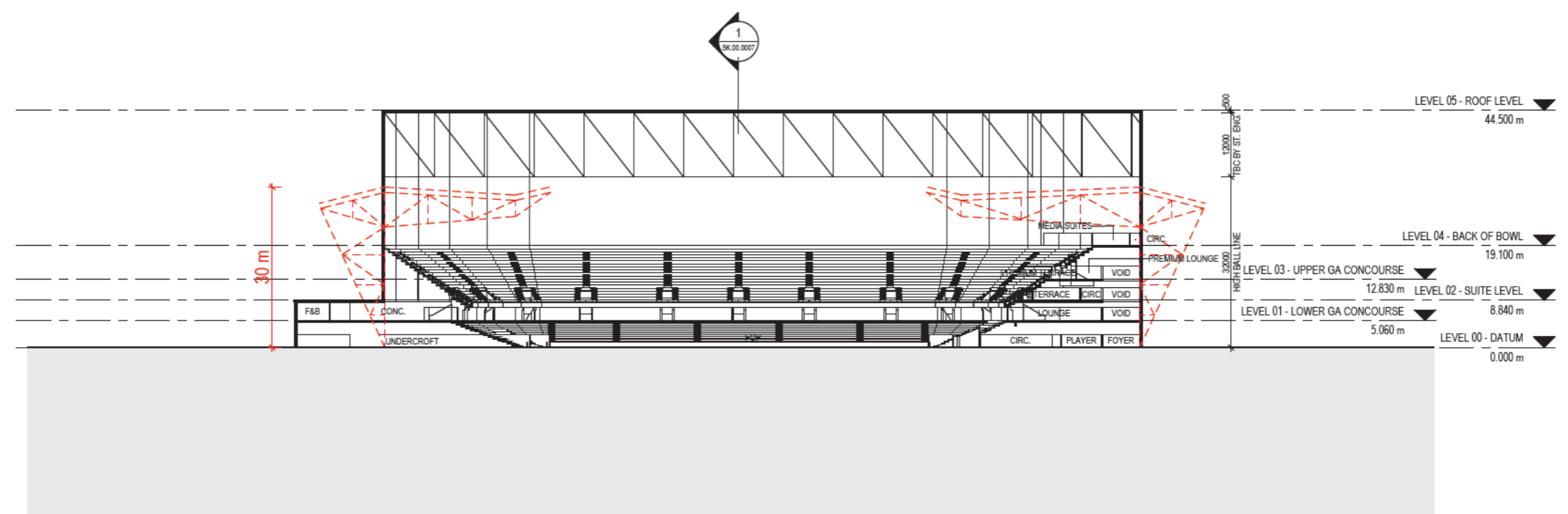
- Great multipurpose allrounder for multi-use sports
- Enclosed atmosphere
- Single 360 concourse for fantastic GA experience
- Does fit on EPIC site
- Northern end height will cast shadowing on F.o.P

Due to the unconstrained nature of the EPIC site, Bowl Option 1 is the most ideal solution for the reasons listed above.





1 NORTH SOUTH
1:500



2 EAST WEST
1:500

4.1.4.2 Preferred Siting

GA Areas

A single, connected GA Concourse has been provided on Level 01 in the North, West and South stands. GA Amenity has been pushed to the façade line as much as possible to create an open concourse along the pitch centrelines. Corner amenity has been tucked under the bowl to create outward viewing opportunities to stadium surrounds. The GA Concourse is accessible vertically through entry foyers located at ground level which open onto the surrounding plaza.

In the Upper West Tier, two GA concourses exist either side of the Members' Terrace and lounge. This is accessible through stairs located at either end of the Premium Foyer.

Premium Areas

Premium Suites and Members' areas exist in the Western Stand. Level 01 contains Lounge and Members' facilities. The lounges are served by satellite kitchen and bar facilities and have the potential to be divided by operable walls to suit different event requirements. Lounges are accessed through the Premium Foyer.

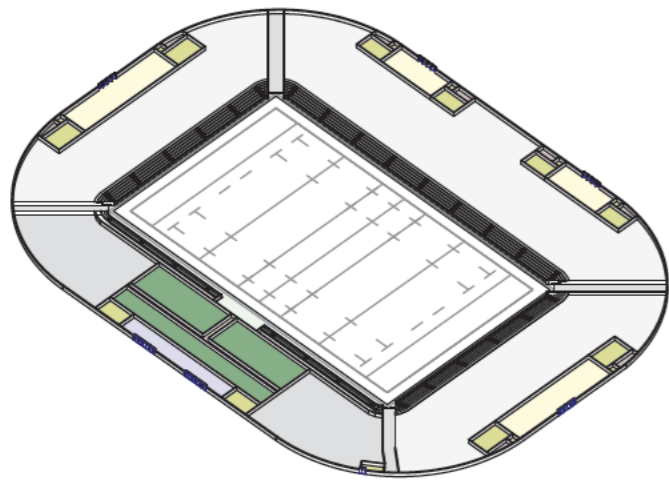
24 Suites of varying capacities exist on Level 02. These suites have access to premium bar and satellite kitchen facilities and are accessed through the premium Foyer. The North and South viewing decks provide the opportunity to access GA areas and allow for the potential of corner bars. Suites have dedicated access through the Premium Foyer and independent circulation.

Operational and Event Areas

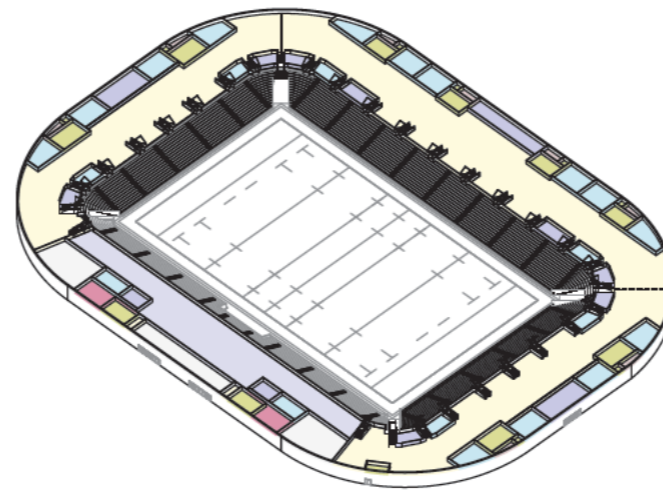
Venue operation and players' areas are located at Ground Level in the Western Stand, with the exception of the Eastern Undercroft. This Undercroft has the potential to house plant or plaza amenity. Administration and media offices have been allowed for in the Back of House zones. Loading and Outdoor Broadcast facilities will be dependent on the eventual siting of the project, but will be best located adjacent to the Media Facilities in the West. Pitch Access Vomitories are adjacent to operational areas to improve efficiencies.

Players' facilities are centrally located with the Players' Chase on the pitch centreline, adjacent to the interchange benches.

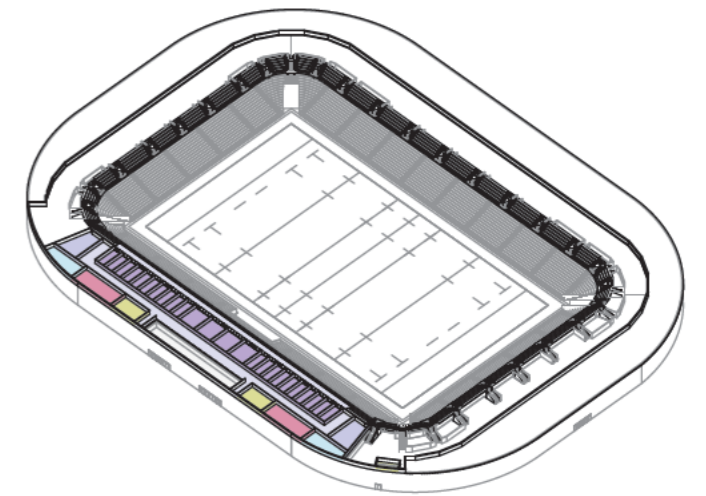
Media Suites have been located at the back of the West Upper Tier. Provision for a Media Lounge and Media Amenities have been allowed for at this level. Dedicated vertical circulation for media staff connects the Outdoor Broadcast Compound, Ground Level media facilities and Level 04 Media Facilities to improve efficiencies.



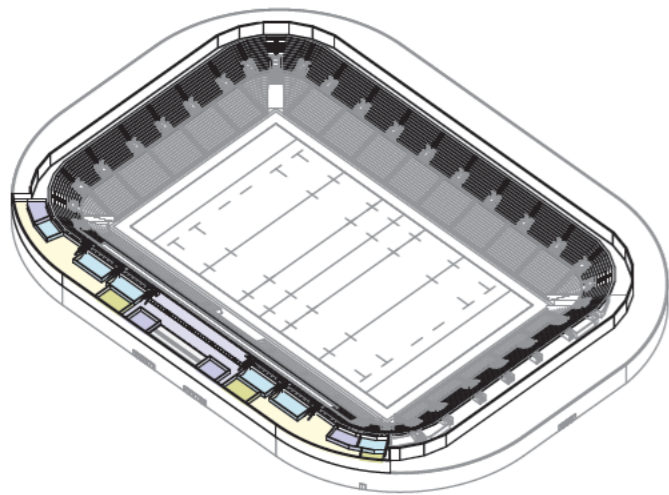
Basement



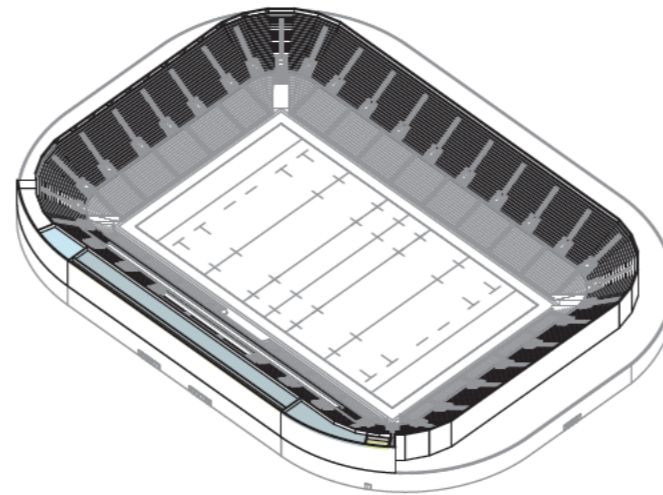
Main concourse and premium lounge



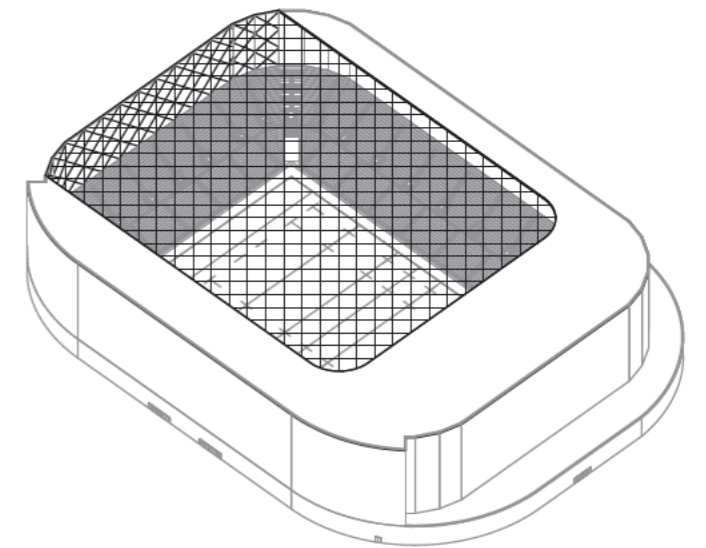
Suites level



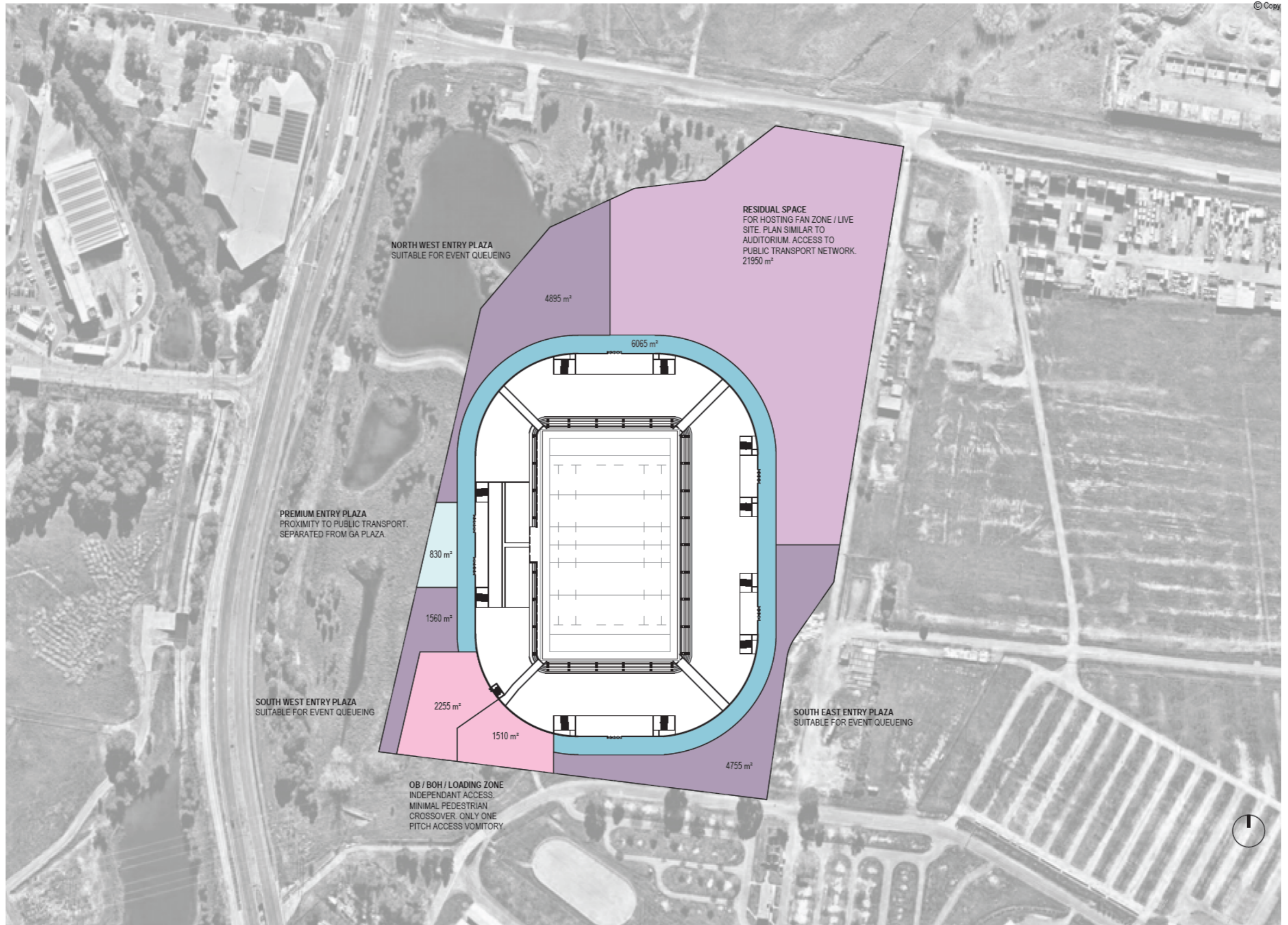
Upper concourse



Media level



Roof level



Site and external plaza diagram

4.1.4.3 Precinct Planning

As mentioned during the Civic site analysis, there are several critical external areas that are required for a stadium to function successfully. These include the external circulation plaza, the patron entry plaza, premium entry plaza and a loading zone. The potential of these spaces for the EPIC site is described below:

Circulation Plaza

The unconstrained nature of the EPIC site allows for a circulation plaza that extends around the entire perimeter of the stadium, stopping only for the loading zone to the south west. Unlike Civic, this will result in very little overlay on event day. The circulation plaza is also able to maintain a constant width, which suits the even spread of patrons across the bowl.

Entry Plaza

Unlike the Civic site, there will be significant flows of patrons arriving from multiple points across the EPIC site. This requires the provision of multiple entry plazas / queueing zones. These locations are focused primarily on those coming from the EPIC and Racecourse Light Rail stop on Flemington Road to the south west and the assumed overlay carparking on the EPIC site to the immediate south

east. An Entry Plaza will also be provided in the north west to pick up the planned additional light rail stop, noting that this stop is only likely to be utilised by patrons coming from Gungahlin. If not consolidated, the dispersed nature of these entry plazas could result in higher operational costs / complexity on event day.

Premium Entry Plaza

There is a small premium plaza zone located adjacent the west stand. It is assumed most Premium Hospitality patrons will arrive by private vehicle, so this plaza is unfortunately located on the opposite side of the stadium to the primary parking areas. This plaza is not able to be easily segregated from the General Admission Plaza as it isn't a defined wedge between the building and site boundary as is the case with the Civic scheme.

Loading

Like Civic, the EPIC loading zone has been located adjacent the west stand, to its southern end. It's positioning at the southern end of the stadium it to allow it to be serviced via the EPIC private road network accessed from Stirling Avenue. Due to the sites Greenfield status, the loading area is able to be sufficiently sized to accommodate both typical loading / operational activities as well as the event day outside broadcast

compound. It's location in the southwest corner does position it between the primary west plaza and the bulk of the overlay parking to the east. As there is a desire to keep the loading and patron circulation routes separate, this would have to be carefully managed on event day.

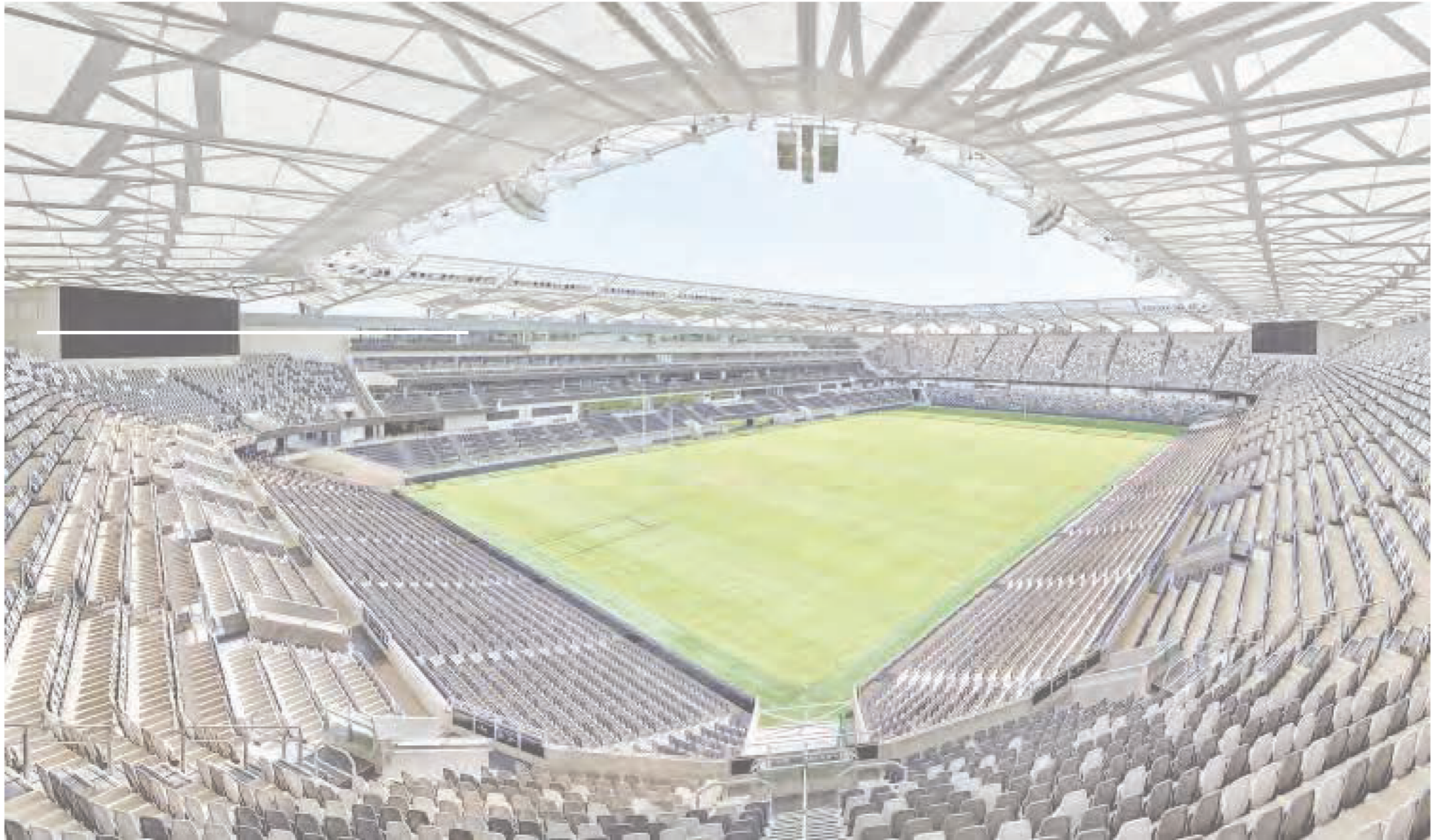
Residual Space

The EPIC site has significant areas of residual space due to its Greenfield status. The function of this space will be similar to that of the Civic site; acting as a live site or fan zone on event day. Due to the lack of proximity to any residential accommodation or commercial enterprise, the residual space is unlikely to be activated on non-event day. The location of the residual space to the north east of the site is the only corner which does not intersect with a patron ingress route, so activation of this zone would require encouragement. Further to this, due to its size and lack of interaction with primary circulation paths, part of it could be used for overlay parking if needed, particularly for VIP patrons.

Overall Summary Comparison

	CIVIC	EPIC
Capacity	No difference between both options.	No difference between both options.
Field of Play	No difference between both options.	No difference between both options.
Roof Coverage	A fully enclosed roof would have a cost premium due to the significantly longer spans generated by the enlarged east and west stands.	A fully enclosed roof would be a simple and relatively straightforward proposition due to the standard, consistent shape.
Orientation	Intangible difference between both options.	Intangible difference between both options.
Premium Hospitality	No difference between both options.	No difference between both options.
Design	Bespoke.	Typical.
Precinct	Residual space limited but better utilised on non-event day and with increased further development opportunities.	Larger area of residual space. Limited activation options on non-event day and limited short-term further development potential.
Urban Design / Activation*	Urban location provides opportunities for contributing to surrounding businesses and activating the city.	Underdeveloped location limits potential to benefit or contribute to neighbouring context.
Height*	Height constraints described and difficult to achieve.	Minimal planning policies provided for site.
Acoustics*	Urban context will require sensitive approach to noise spill. Planning constraints also in place. Community dissatisfaction risk to be managed.	Low surrounding population reduces risk for noise related issues. Minimal planning policies provided for site.
Traffic*	The central location provides easy public transport locations from multiple directions. Decentralised parking arrangement proposed to reduce congestion.	Easy public transport from the city and Gungahlin. Centralised parking available on site. Reduced availability of public transport and centralised parking will result in increased localised congestion on event day.
Security*	Pinch points due to site constraints create potential weak points. Crowd spill onto neighbouring roads not under the jurisdiction of the stadium a risk.	Large open spaces reduces pinch points and adjacent road network being located on EPIC land makes it easier to manage risk through event day overlay.

*Refer to previous sections of report for detailed analysis.



Site Options Summary

Based on the above analysis, it is clear that the three areas which have the largest differentiation across the two sites from an architectural standpoint are roof coverage (largely impacting constructability), design and precinct. At this level of resolution the determining factor for both roof coverage and design is the seating bowl.

Roof Coverage

Stadiums with fully enclosed roofs are typically designed with a cable net structural system, or via a series of trusses which span the shorter axis, from east to west. An even spread of patrons across the four stands, as per the EPIC bowl design, results in a more efficient footprint. Due to the north south boundary constraints on Civic, the north and south stands are considerably smaller than their EPIC equivalent. This results in significantly larger east and west stands to maintain the 25,000 patron capacity. This results in longer spans for the roof trusses, should a fully enclosed option with this structural system be pursued.

Design

As mentioned above, the unconstrained nature of the EPIC site has resulted in a seating bowl design that could be

described as typical. There is an even spread of patrons across the four stands, with a continuous lower tier and an upper tier that only deviates to accommodate the premium hospitality suites. Due to the constrained north south dimension on the Civic site, a bespoke seating bowl design has been pursued.

These different design outcomes have two main impacts. The first is on constructability and therefore cost. A large footprint, with larger tiers increases cost and complexity. The second is on fan experience and atmosphere. Pros and cons for different seating bowls depend on the specific use or experience the venue intends to offer. For example, a continual bowl around all four sides (like EPIC), provides a sense of enclosure and great overall atmosphere for all events; an example of this would be Bankwest Stadium. Separate stands however (like Civic), can create identity (home and away ends) or establish a grouping of occupants by demographic. Examples of this would be a “Kop” or single tier stand that can be seen at stadiums such as Anfield, and Tottenham Hotspur Stadium in the UK.

As Canberra Stadium is intended to serve multiple sports, an in the round bowl as per the EPIC design, would be the preferred outcome. Whilst this bowl style doesn't define individual stands, it is still capable of

providing differentiation for a range of demographics; as the super fan, family fan and premium fan will still all want something different.

Whilst the Civic site is unable to achieve this due to its constrained long axis, the proposed outcome (Design Option 4) still provides a successful result. This option enlarges the lower tier to provide the ‘in the round’ experience as much as possible, still provides a feeling of containment or density of fans and provides options for different demographics, including family zones, premium facilities and ‘home’ or ‘active’ supporter zones. In addition to this, it has both open and enclosed concourses that offer the best of both worlds in terms of providing visual connections to the playing area, the seating bowl and the concourses (i.e. F+B and WC's), as well as providing the openness of an ‘infinity bowl’ and a relationship to its urban context through visual connections to the city.

Other benefits of the design of Option 4 include; maximised Northern light to the F.o.P, open areas for video replay and scoreboards, an increased single tier active end zone for ‘super’ fans, a high degree of flexibility in product offering for a wider variety of demographics and on grade concourses for universal access.

Precinct

The two main factors when considering a precinct design are available space and activation opportunities. The Civic precinct is more constrained but offers far greater potential for activation and therefore economic contribution to the surrounding context. It also provides greater possibilities for future development because of its urban context. Drawing people to the site on non-event day can also contribute to the venues ongoing viability and encourages its function as a multi-use asset. Whilst the EPIC site benefits from increased space and therefore reduced complexity on event day, its lack of a relationship with any neighbouring activation sources, could limit its capacity for non-event day use.

Conclusion

Overall these venues are offering very different outcomes. One is a bespoke urban venue which will have strong links back to its surrounding context and has the potential to tap into the existing neighbouring network of complementary facilities and supporting industries. The other is a more typical design on an open site, with less operational complexity but also less potential to giveback and engage with its surrounding context. What is important to note is that both are feasible and both address the key requirements of the brief.

6.5 Accessibility

6.5.1 Existing road network

The EPIC precinct is served by two major routes connecting North Canberra to the CBD, South Canberra and surrounding area, see Figure 29.

The EPIC precinct is located at the intersection of Flemington Rd and Federal Highway, the major route connecting the Gungahlin region to the CBD and South Canberra.

The traffic along this route is tidal in nature. The morning peak period is between 8:00am and 9:00am while the afternoon peak period is from 5:00pm to 6:00pm. Outside of these peaks, traffic is much lighter but consistent.

The inner north, CBD and South Canberra is connected by Northbourne Avenue, a 6-lane boulevard with an AADT estimate of 40,000.

The Northern suburbs of the Gungahlin region are connected by Flemington Road, a 4-lane road that links Northbourne Avenue / Federal Highway with the Gungahlin Town Centre.

The main east-west connectors are Ginninderra Drive and Barton Highway providing access to major north-south routes Gungahlin Drive and Northbourne Ave.



Figure 29: EPIC Site Surrounding Road Network

6.5.2 Future road network

A 1.25 km extension of Morisset Rd is planned. Extending it to the Antill Street/Federal highway intersection as well as upgrading to current design standards and improving the stormwater infrastructure on Sullivan's Creek as shown in Figure 30. The upgrade will allow for additional opportunities for active travel infrastructure and will serve as another access point to the EPIC precinct from the north.

6.5.3 Public Transport

The existing public transport options include light rail and one scheduled service. The light rail services the CBD to Gungahlin, and the route 18 bus services the suburbs of Gungahlin, Franklin, Harrison, Mitchell and Kenny. Both light rail and the bus route are shown in Figure 31.

Figure 31 Public Transport Options (<https://www.transport.act.gov.au/getting-around/>)

An additional light rail stop is planned to be constructed at the intersection of Morisset Rd / Sandford Street and Flemington Rd. This will provide additional stop capacity and may help to divide northern and southern arrivals and departures, reducing overcrowding on light rail stop platforms.

There is an opportunity to provide a small bus interchange at the stadium to allow for event day buses such as the QCity services. Alternatively, bus services could connect to light rail interchange stops (Gungahlin, Dickson, Alinga Street and future Commonwealth Park and Woden). This may allow existing bus services to run at reduced headways and provide a more convenient and attractive service.

6.6.4 Parking

The EPIC precinct is estimated to contain over 4000 car spaces accessible from Old Well Station Road, Morisset Road and via the EPIC main entrance on Flemington Road. This volume of carparks compares to the scale of parking at GIO stadium.

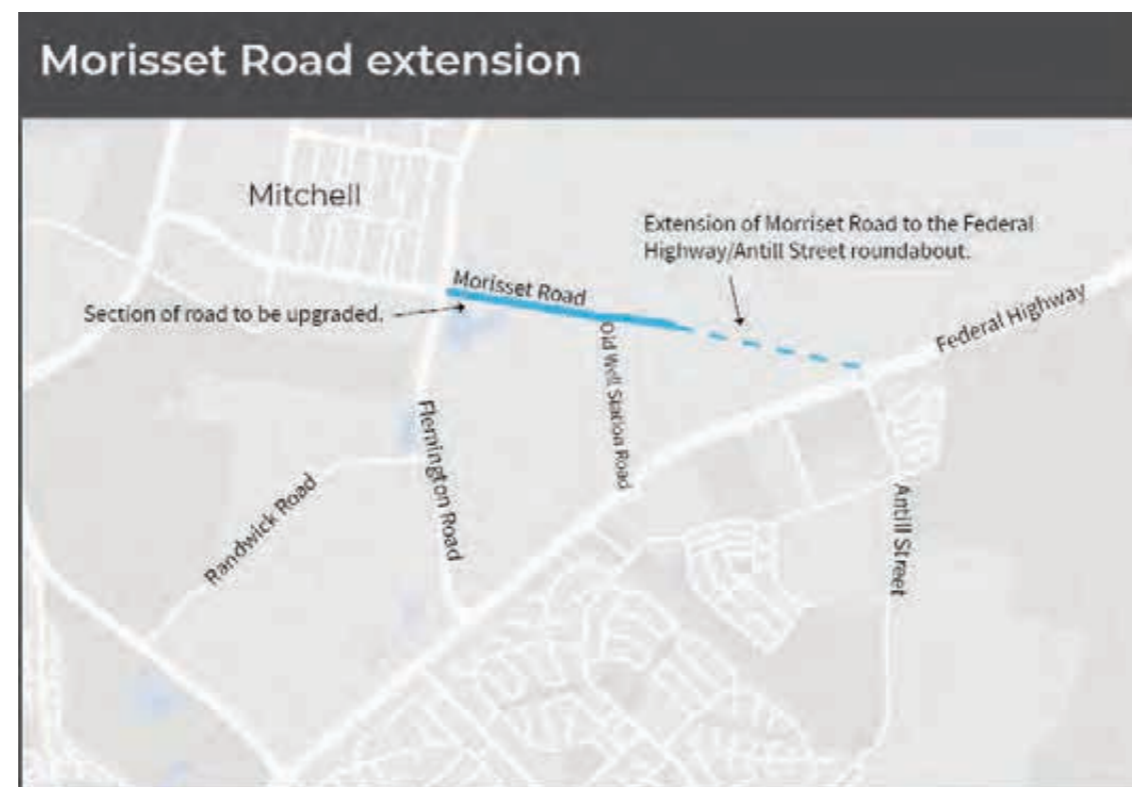


Figure 30: Morisset Road Extension (<https://www.cityservices.act.gov.au/Infrastructure-Projects/city-inner-north-and-inner-south/morissetroad-extension>)

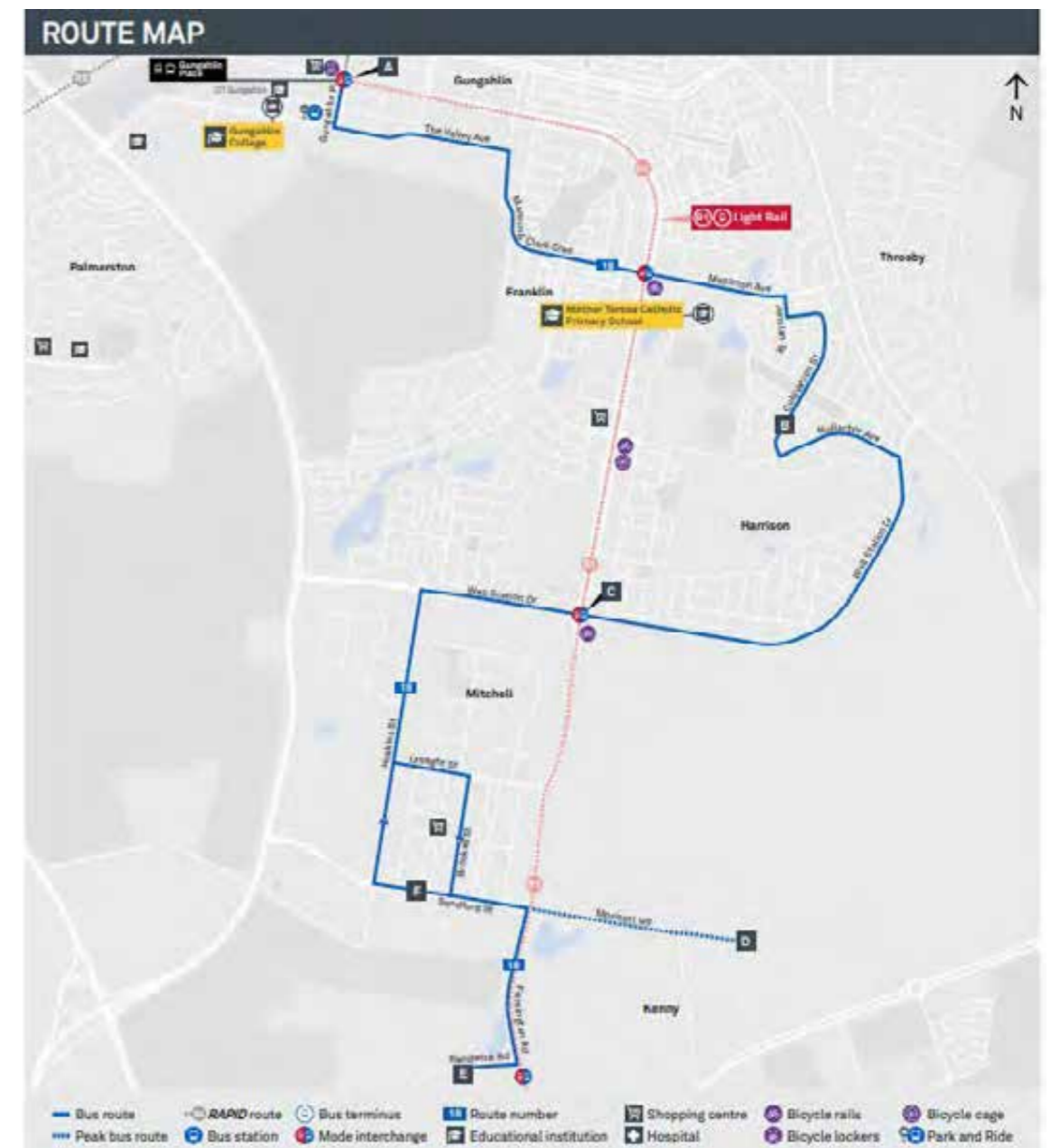


Figure 31: Public Transport Options (<https://www.transport.act.gov.au/getting-around/>)

6.7 Utilities and drainage

6.6 Security

Refer to Section 5.6.

See Section 5.7 for the methodology adopted for identifying existing services. The utilities impact on the three stadium options within the EPIC precinct are outlined in Section 6.7.1, 6.7.2 and 6.7.3.



Figure 32: Utility Impacts on Location B

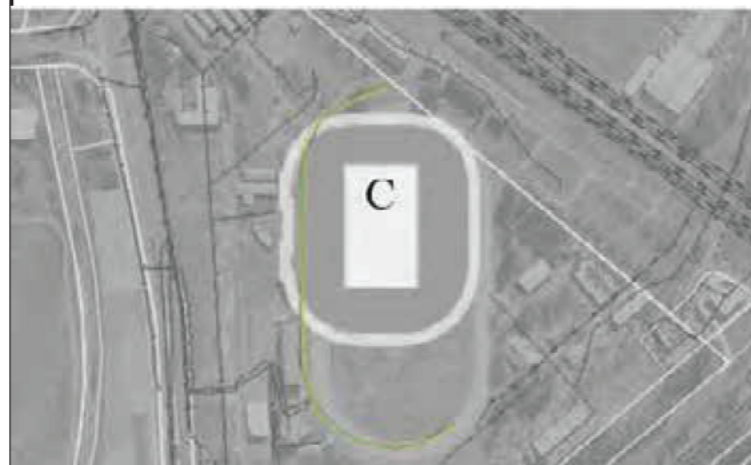


Figure 33: Utility Impact on Location C



6.7.1 Location A

No impact to existing utilities

6.7.2 Location B

The following utilities will need to be re-aligned outside the footprint of the stadium as shown in .

- 390m of a 375mm diameter water main running east-west from Flemington Road
- 350m of a 225mm diameter sewer main running east-west from Flemington Road.

6.7.3 Location C

250m of telecommunications servicing the site are impacted and would be removed as shown in Figure 33.

07

Sustainability

Approach



7.0 Sustainability

Establishing a sustainability strategy is an important part of a large project and has the greatest impact when initial steps are taken early in the project life. Although this preliminary technical assessment focuses on the factual assessment of each site, this section has been included as an early thoughts piece for consideration as the project progresses, and aims to stimulate discussion at the earliest possible time.

As a large project with a focus on service and amenity for the community, the opportunity to deliver significant social, environmental and economic outcomes beyond business-as-usual exists. The ACT's new Wellbeing Framework provides a starting point for determining what these outcomes could be. Inspired by the Framework, this section of the Report explores initial ideas for the stadium.

Ideas have been generated against impact areas. These impact areas are potential benefits that could be realised through the stadium and have been related back the 12 domains of the Wellbeing Framework in Figure 34.

The impact areas and ideas below are intended to demonstrate the significant impact that the stadium could create beyond its inherent benefits. They are general in nature and intended to be a starting point for future discussions with the community, industry, government, and national institutions. Ideas are applicable to both sites, however given the Civic sites existing identity and space constraints, and EPIC's lack of constraints, some ideas may be better suited to one site.

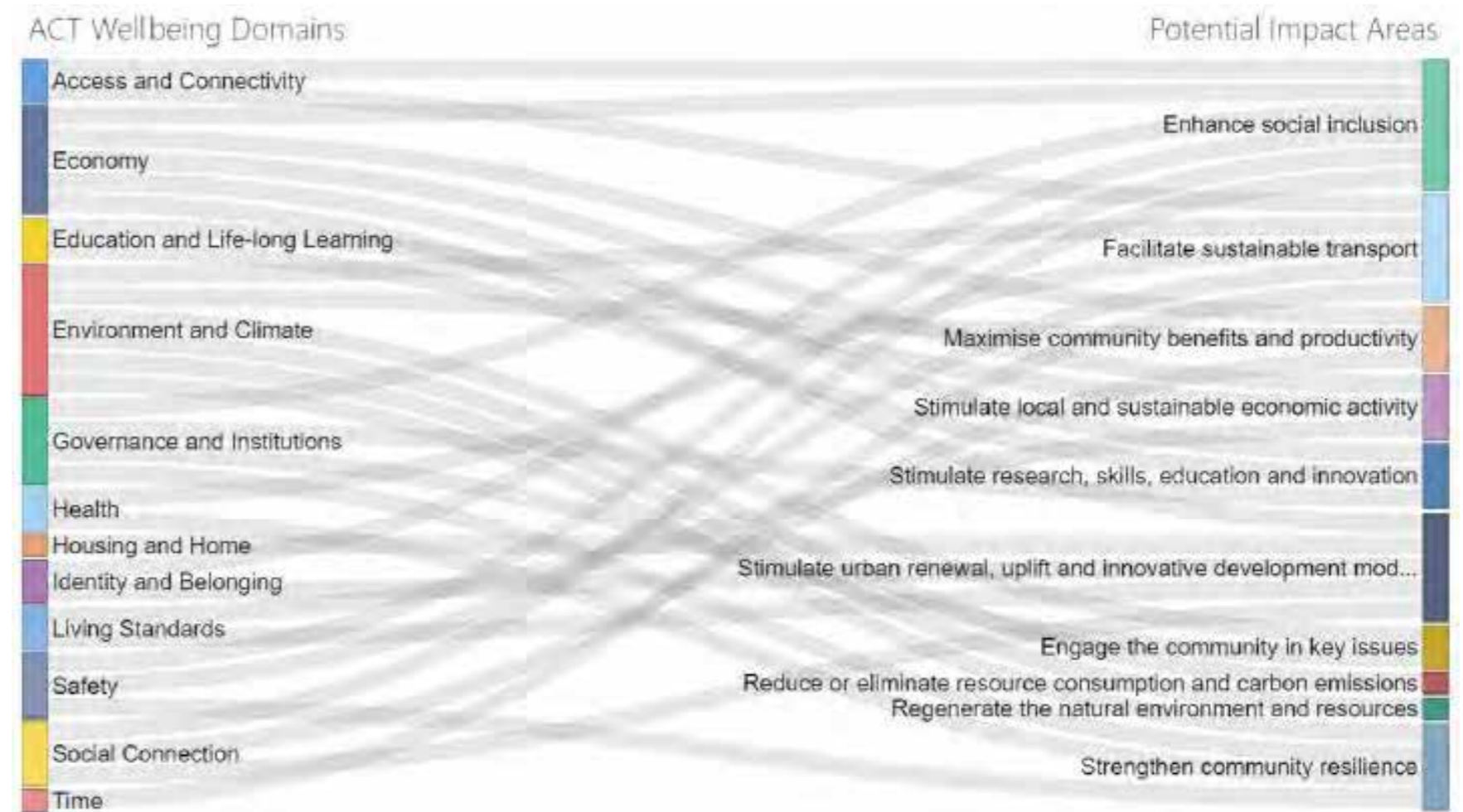


Figure 34: Potential sustainability impact areas and the ACT wellbeing framework domains

7.1 Stimulate local and sustainable economic activity

While the stadium will naturally stimulate the economy, especially in adjacent precincts, there is the opportunity to do this in a way that prioritises sustainable and local economic activity. Possible actions include:

- Create a local ‘hub’ of complementary, sustainable industries.
- Set targets for local and sustainable procurement during both construction and operation, such as for food.

7.2 Reduce or eliminate resource consumption

A reduction in the consumption of resources and the emission of carbon dioxide is non-negotiable in the ACT. As a large project, the stadium has the opportunity to demonstrate leadership in this space and go beyond standard targets and approaches. Possible actions include:

- Set ‘zero targets’ for energy, carbon and waste.
- Eliminate single-use plastics.
- Collect rainwater, implement water-efficiency measures and reuse water

where possible, given the large water requirements of a stadium.

- Re-use second-life batteries for back-up power.
- Generate renewable electricity through solar photovoltaics, small wind turbines, solar elements built into structures like bridges or roofs, or energy-generating pavements or escalators.
- Reduce embodied carbon in materials.
- Select materials and design for end-of-life.

7.3 Regenerate the natural environment

Beyond reducing the impacts of the stadium, the project could consider actively regenerating natural systems. Possible actions include:

- Incorporate living infrastructure such as green roofs or rain gardens, or design paradigms such as biophilic design. A certification such as the Living Building Challenge could be used to guide this.
- Divert food and organic waste from landfill for return to the biosphere.
- Identify areas or alternative sites to reclaim or restore the health of ecosystems.

7.4 Facilitate sustainable transport

Given the need for transport to and from the stadium, there is the opportunity to prioritise more sustainable and active transport modes. Possible actions include:

- Prioritise pedestrians and cyclists, both through improved design/ infrastructure and through adaptive road use (e.g. using digital signage to block roads off to cars and promote active travel during large events).
- Provide free electric vehicle charging.
- Provide free public transport.
- Target 80% travel by public and active transport
- Provide a bicycle valet service to promote cycling as a viable and secure option.
- Provide an express zero-emission vehicle shuttle to the airport or other key locations.

7.5 Strengthen community resilience

Resilience is increasingly recognised as an important investment area at all levels – from asset owners to Federal Government. The stadium will need to consider its own resilience as an asset, as well as how it contributes to the resilience of Canberra as a whole. Possible actions include:

- Consider opportunities for the stadium to be used in emergency situations or to address community resilience needs.
- Complete scenario mapping to understand how different shocks and stresses, beyond only climate-related risks, would impact operation of the stadium and Canberra more broadly.
- Enhance the climate resilience of the site through living infrastructure, microclimate modelling and a comprehensive risk assessment process.

7.6 Stimulate technology

Canberra has a strong research and education base which the stadium could both support and benefit from. Possible actions include:

- Identify areas of research that the

stadium could support, especially through Canberra-based research organisations such as the CSIRO, ANU, UC, UNSW or CIT.

- Enhance innovation and get the community involved through a hackathon or other community-based initiative with the Canberra Innovation Network.
- Through procurement, focus on developing skills required for a 'just transition' through apprenticeships, training or targets, working with organisations such as Skills ACT.7.7 Enhance social inclusion

By creating an inclusive and accessible stadium, more people will be able to benefit from and be proud of its construction. Possible actions include:

- Take an active approach to gender inclusion in programming, facilities, education and decision-making.
- Adopt universal design principles.
- Address issues currently experienced in stadiums, such as anti-social behaviour or harmful marketing, potentially through policies, marketing or 'crime prevention through environmental design'.
- Partner with cultural and community institutions, such as national institutions, indigenous organisations, multi-cultural events or embassies.

Diversify the use case of the stadium, so that it is something all Canberrans will use. (See 'maximise community benefits and productivity')

7.7 Enhance social inclusion

By creating an inclusive and accessible stadium, more people will be able to benefit from and be proud of its construction. Possible actions include:

- Take an active approach to gender inclusion in programming, facilities, education and decision-making.
- Adopt universal design principles.
- Address issues currently experienced in stadiums, such as anti-social behavior or harmful marketing, potentially through policies, marketing or 'crime prevention through environmental design'.
- Partner with cultural and community institutions, such as national institutions, indigenous organisations, multi-cultural events or embassies.
- Diversify the use case of the stadium, so that it is something all Canberrans will use. See 'maximise community benefits and productivity'

7.8 Engage the community in key issues

As a hub where the community meets, the stadium could be used to communicate

and educate the community. Possible actions include:

- Have highly visible, multi-stream waste facilities that educate the community on how to recycle in the ACT.
- Sell naming rights to an organisation with values and/or objectives aligned to those the stadium adopts, or name the Stadium in a way that promotes a particular cause.
- Host events or display information on important issues. Real-time display of sustainability performance could be used to both create accountability on sustainability performance and to educate the public.
- Sporting teams who use the stadium could become formal advocates for issues that are then promoted in the stadium or embedded into its design. Some initiatives are already in place which could be expanded.

7.9 Maximise community benefits and productivity

By optimising the use of the stadium, community benefits can be maximised and the consumption of resources can be minimised. Possible actions include:

- Maximise utilisation of the stadium, with a focus on promoting community use of the stadium when events are not on, and ensuring the space is used year-round.

- Take a circular economy approach to the stadium, exploring opportunities around flexibility in use (e.g. demountable seats, flexible spaces), and end-of-life (e.g. design for disassembly or re-use).
- Work with different sections of the community to identify possible uses of the space. This could be community focused groups, industry, universities and national institutions – e.g. galleries and museums could use the space for displays.

7.10 Stimulate urban renewal

The stadium will naturally provide uplift to the precinct it serves; however this could be done in more targeted ways to achieve particular outcomes or co-benefits with other developers. Possible actions include:

- Explore opportunities for innovative mixed-use of the precinct, incorporating social- or multi-generational housing models.
- Embed local and/or indigenous art in the design of the stadium through collaboration or provide spaces where this can be displayed following construction.
- Adopt a particular approach to design such as 'biomimicry' – whereby the design imitates the natural world.
- Utilise space for urban farming technology and practices.
- Explore co-location of complementary social infrastructure or Territory facilities.

08

Implementation
program



8.0 Implementation Program

A high-level implementation program was developed for the Civic site and one of the sites within the EPIC precinct.

Table 16 outlines assumptions that were considered whilst developing the program.

Planning	Feasibility, Business Case
Approvals	Environmental, Development Application, Works Approval, National Capital Plan Amendment
	Reference Design, Assume Design and Construct
	Dependencies, Early works, Main works

Table 16: program assumptions

8.1 Civic Site

See Appendix C1 for a more detailed program. Figure 35 summarises the main items and their dependencies. Overall the main items are broken into:

1. Pre-feasibility: including needs establishment – 8 months
 2. Business Case: including definition design – 9 months
 3. Approvals: including environmental & NCA – 25 months
 4. Procurement: reference design, EOI & tendering – 18 months
 5. Construction: including detailed design & early works – 42 months
- Total time allowed: 75 Months

8.2 EPIC Site

See Appendix C2 for a more detailed program. Figure 36 summarises the main items and their dependencies. Overall the main items are broken into:

1. Pre-feasibility: including needs establishment – 8 months
2. Business Case: including definition design – 6 months
3. Approvals: including environmental & NCA – 18 months
4. Procurement: reference design, EOI & tendering – 19 months
5. Construction: including detailed design & early works – 38 months

Total time allowed: 69 Months

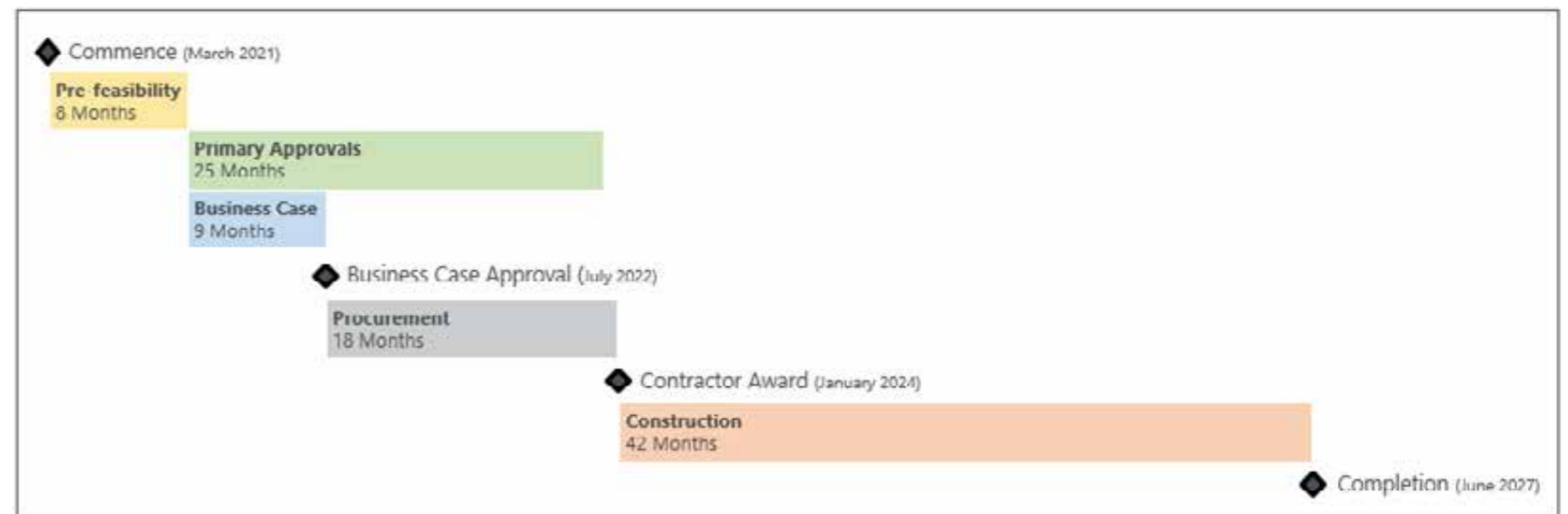


Figure 35: implementation program - civic

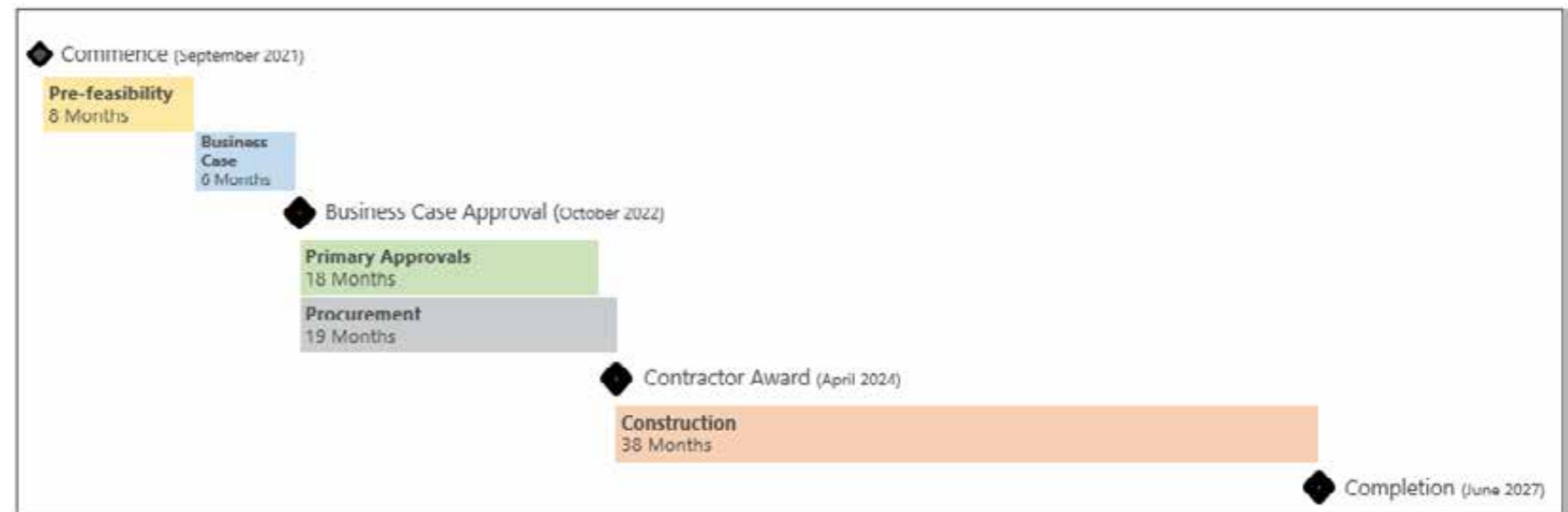


Figure 36: implementation program - epic

09

Cost
estimates



9.1 Overview TBC

Our high-level cost estimates consider, not only the cost of the stadium itself, but associated infrastructure requirements such as utilities relocation and local roads reconfiguration. Allowances for Project Delivery Costs, Client Costs, Contingency, Escalation and MPC Overheads have been included.

Assume procurement methodology is designed and construct contract tendered under competitive contract.

A deterministic percentage to each cost component to cover risk and contingency based on benchmark and previous experience has been applied. No probabilistic modelling has been carried out. the deterministic contingency is only indicative. the percentages allowed as follows:

- Stadium costs - 10% contingency
- Infrastructure and precinct costs - 30% contingency
- Project delivery client costs - 40% contingency

9.1 Civic Pool Site

100% DRIPLINE ROOF + FAÇADE ENCLOSURE	BASE DATE	OPENING BY 2027	OPENING BY 2032
Description	Total		
D&C CONSTRUCTION COSTS			
STADIUM COSTS			
Direct Costs	\$ 288,860,729	\$ 324,968,320	\$ 361,075,911
Indirect Costs	\$ 87,842,548	\$ 98,822,866	\$ 109,803,185
STADIUM COSTS [Subtotal]	\$ 376,703,277	\$ 423,791,186	\$ 470,879,096
PRECINCT & INFRASTRUCTURE COSTS			
Direct Costs	\$ 19,024,998	\$ 21,403,123	\$ 23,781,248
Indirect Costs	\$ 5,785,502	\$ 6,508,690	\$ 7,231,877
PRECINCT & INFRASTRUCTURE COSTS [Subtotal]	\$ 24,810,500	\$ 27,911,812	\$ 31,013,125
PROVISIONAL SUMS - UNDEFINED			
Prov. Sum for disposal of material classified as GSW	\$ 2,000,000	\$ 2,250,000	\$ 2,500,000
PROVISIONAL SUMS - UNDEFINED [Subtotal]	\$ 2,000,000	\$ 2,250,000	\$ 2,500,000
D&C CONSTRUCTION COSTS [Subtotal]	\$ 403,513,777	\$ 453,952,999	\$ 504,392,221
CLIENT COSTS [Subtotal]	\$ 33,210,827	\$ 36,684,905	\$ 39,489,545
CONTINGENCY	\$ 58,997,808	\$ 66,372,534	\$ 73,747,260
ESCALATION	\$ -	inc above	inc above
MPC OVERHEADS	\$ 22,594,254	\$ 25,418,536	\$ 28,242,818
TOTAL PROJECT COSTS	\$ 518,316,666	\$ 582,428,975	\$ 645,871,844
OPTIONS - IMPACT TO TRADE COSTS ONLY			
ADDITIONAL OPTION - FULL ROOF COVERAGE	\$ 30,693,570		
ADDITIONAL OPTION - MULTISTOREY CAR PARK - 1,000 BAYS	\$ 35,706,000		
DISCOUNT - NO FULL FAÇADE ENCLOSURE	-\$ 49,695,000		

9.2 EPIC Site

100% DRIPLINE ROOF + FAÇADE ENCLOSURE	BASE DATE	OPENING BY 2027	OPENING BY 2032
Description	Total		
D&C CONSTRUCTION COSTS			
STADIUM COSTS			
Direct Costs	\$ 297,400,632	\$ 334,575,711	\$ 371,750,790
Indirect Costs	\$ 90,439,532	\$ 101,744,474	\$ 113,049,415
STADIUM COSTS [Subtotal]	\$ 387,840,164	\$ 436,320,185	\$ 484,800,205
PRECINCT & INFRASTRUCTURE COSTS			
Direct Costs	\$ 14,390,151	\$ 16,188,920	\$ 17,987,689
Indirect Costs	\$ 4,376,045	\$ 4,923,051	\$ 5,470,056
PRECINCT & INFRASTRUCTURE COSTS [Subtotal]	\$ 18,766,196	\$ 21,111,970	\$ 23,457,745
PROVISIONAL SUMS - UNDEFINED			
Prov. Sum for disposal of material classified as GSW	\$ 2,000,000	\$ 2,250,000	\$ 2,500,000
PROVISIONAL SUMS - UNDEFINED [Subtotal]	\$ 2,000,000	\$ 2,250,000	\$ 2,500,000
D&C CONSTRUCTION COSTS [Subtotal]	\$ 408,606,360	\$ 459,682,155	\$ 510,757,950
CLIENT COSTS [Subtotal]	\$ 31,016,382	\$ 34,314,905	\$ 37,009,822
CONTINGENCY	\$ 57,420,428	\$ 64,597,981	\$ 71,775,535
ESCALATION	\$ -	inc above	inc above
MPC OVERHEADS	\$ 22,594,254	\$ 25,418,536	\$ 28,242,818
TOTAL PROJECT COSTS	\$ 519,637,424	\$ 584,013,578	\$ 647,786,125
OPTIONS - IMPACT TO TRADE COSTS ONLY			
ADDITIONAL OPTION - FULL ROOF COVERAGE	\$ 30,499,600		
ADDITIONAL OPTION - MULTISTOREY CAR PARK - 1,000 BAYS	\$ 35,706,000		
DISCOUNT - NO FULL FAÇADE ENCLOSURE	-\$ 41,961,000		

10

Key project
risks



10.1 Key Project Risks

Initial key project risks have been identified for the Civic Site and the EPIC Precinct, see Table 17.

No.	Risk	Description	Applies to Site
1	NCP amendment	National capital plan amendment is required for heights above 25m and stadium as a land-use development	Civic
2	Works approval	Delays in obtaining works approval	Civic
3	NCA requirements	Potential for NCA quality requirements to be high, increasing the project outturn cost	Civic
4	Parkes Way upgrade	Interface between stadium and Parkes Way may be impacted by future Parkes Way designs	Civic
5	Pedestrian movements	Large volumes of pre and post event pedestrians may result in local network congestion	Civic
6	Public transport	Site is more dependent on public transport due to reduced carparking option. Risk of delayed light rail implementation may require event only bus services as an interim public transport solution	Civic
7	Existing facilities	Existing showgrounds and training will need to be relocated before a stadium can be constructed, risk that appropriate replacement land is not available in the time required	EPIC location B EPIC location C
8	Funding	Delays in funding may induce increased escalation	All
9	Traffic impacts	Detailed traffic modelling may highlight unacceptable traffic impacts	All
10	Site conditions	Unidentified site conditions such as contamination or geological formations may impact project program and budget	All
11	COVID-19	Changes in design standards as a result of COVID-19 may result in unknown design requirements	All
12	Availability of Contractor	High volume of infrastructure projects under construction may result in a less than competitive construction price	All
13	Environmental	Presence of endangered species may trigger EIS and delay program and increase costs	All

Table 17: key project risks

11

Conclusion and next steps



The ACT Government has set requirements for the purpose of this technical study for a new rectangular stadium in Canberra, these being:

1. Patron capacity of at least 25,000 seats
2. North-south field orientation, or slightly deflected
3. Fully enclosed roof, with consideration of a 100% dripline roof

Adopting the baseline requirements, this preliminary technical analysis has determined that a new stadium could fit within the boundaries of the existing Civic Pool site, however some stadium and site compromises are required and are summarised in Table 18. A stadium in the city area will complement existing entertainment facilities and may offer a good opportunity for added economic stimulus and precinct enhancement through new developments. Figure 37 illustrates the massing on the Civic site

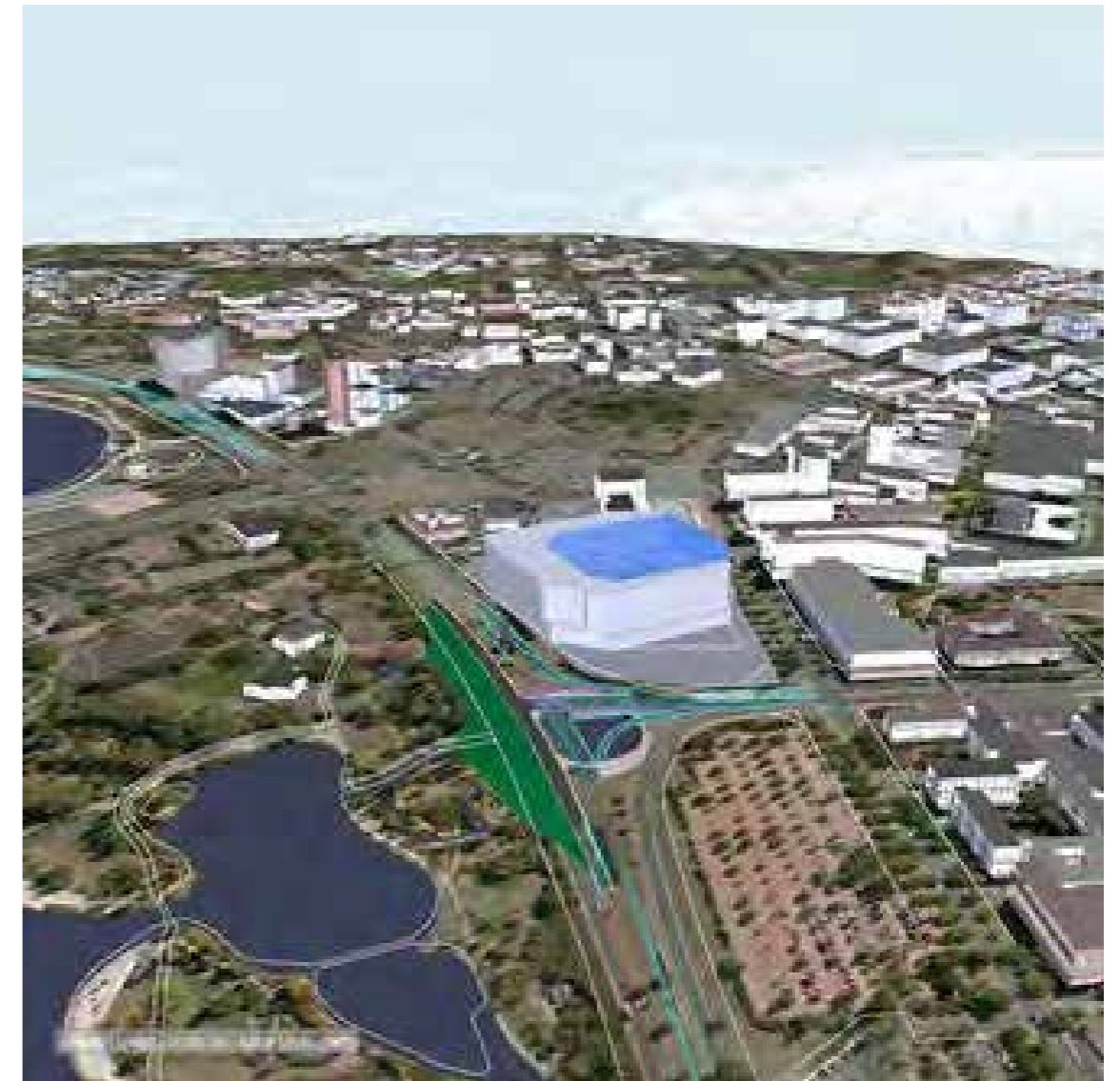


Figure 37: Illustrates the massing on the Civic site



Figure 38: Illustrates the massing on the EPIC site A



Figure 39: Illustrates the massing on the EPIC site B



Figure 40: Illustrates the massing on the EPIC site C

A high-level assessment was conducted on three separate locations within the EPIC precinct before site B was selected by the ACT Government for the purpose of this technical study. The high-level assessment has determined that a stadium may be located on either site with some site compromises as summarised in Table 19. The EPIC precinct does not currently include complementary developments such as entertainment venues. A wider precinct master plan should be considered to maximise the potential if it is selected as the future site of the new stadium. Figure 38, Figure 39 and Figure 40 illustrates the massing on the EPIC sites

Civic Site
An amendment to the National Capital Plan (NCP) will be required as the roof will be higher than is currently permitted (25m – NCP)
An amendment to the NCP may be required as 'Stadium' is not listed in the NCP permissible land uses
Patron and traffic movements on event days require careful assessment to provide the best solution with the least impact to congestion
Future upgrades of Parkes Way will need to be coordinated with the design development of the stadium
The existing pool will need to be removed; a replacement location has not been considered in this study
An existing 600mm sewer main that runs north-south through the centre of the site will need to be diverted
Acoustic impacts will need careful consideration due to proximate developments
The outline of the seating bowl needs to be tailored to the site shape and size
The north and south grandstands will be single tiered
The east and west grandstands will be two-tiered
There will be no on-site carparking, existing city parking will be utilised

Table 18: Site and Stadium Compromises - Civic Site

Location A (north-east)	Location B (north-west)	Location C (south-west)
ACT grassland habitat is impacted and may require offsetting		
	The existing training track will need to be removed; a replacement location has not been considered in this study	The existing trotting track and show arena will need to be removed; a replacement location has not been considered in this study
	An existing minor sewer main and water main that run east-west through the centre of the site will need to be diverted	
Potential impact to endangered species which may trigger an EIS		
Patron and traffic movements on event days require careful assessment to provide the best solution with the least impact to congestion		
Existing on-site carparking to be utilised		
Sites are served only by north-south light rail corridor		
Precinct surrounding the stadium should be considered for wider master planning to help complement the stadium development		

Table 19: Site and Stadium Compromises – EPIC Precinct

11.1 Next Steps

Key recommendations for the next project activities include a Pre-feasibility Study and preparation of a Business Case.

1. Pre-feasibility Study including:

- a) Site investigations
- b) Traffic study
- c) Site analysis – Civic, EPIC location A, B & C
- d) MCA and selection of preferred site
- e) For the preferred site:
 - i. Concept design including required infrastructure upgrades
 - ii. Cost estimates
 - iii. Identify wider precinct opportunities
 - iv. Key venue stakeholder consultation
 - v. NCA engagement

2. Business Case including:

- a) Economics & investment
 - i. Establish project objectives
 - ii. Business Requirement Specifications (BRS)
 - iii. Develop stadium utilisation profile
 - iv. Patron demand modelling and related economic analysis
 - v. Projected operating performance
 - vi. Procurement, funding and delivery options
 - vii. Venue ownership, governance, operating and management structures
- b) Design
 - i. Definition design including relevant infrastructure upgrades
 - ii. Flood Impact Assessment
 - iii. Traffic Impact Assessment
 - iv. Acoustic Impact Assessment
 - v. Environmental
 - vi. Sustainability strategy & ESD
 - vii. Construction staging
 - viii. Implementation program

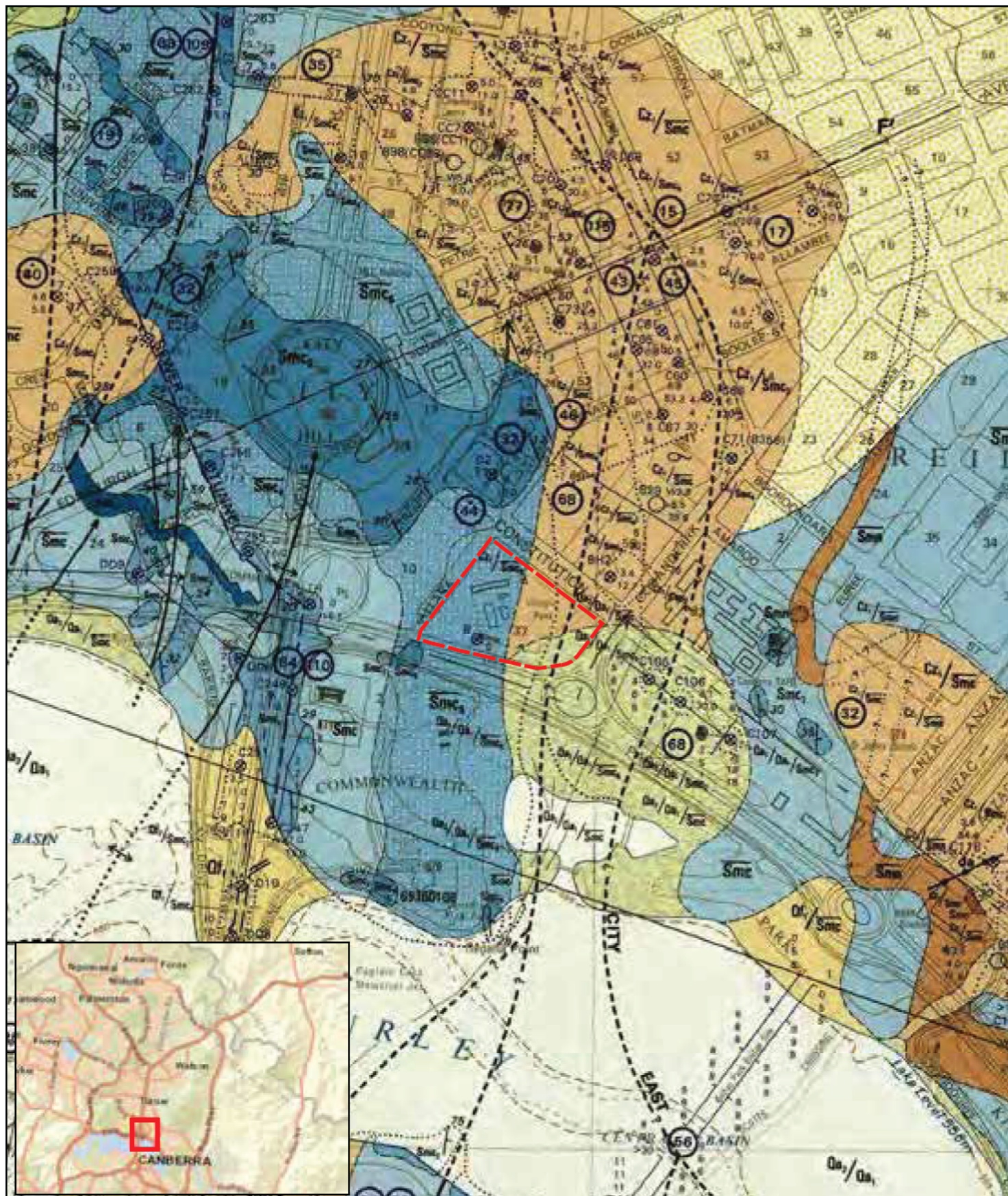
- c) P90 Cost estimates
- d) Project risks
- e) Corporate sponsorship or investment opportunities
- f) Vocational partners – UNSW, CIT, AIS
- g) Market sounding – construction sector
- h) Key venue stakeholder consultation
- i) NCA engagement



A

Appendix A

Geological Maps



Legend

- Civic Site Boundary
- Fill
- Gravel, sand, silt, clayey gravel and sand, clay
- Clay, silt, loam, sandy and silty clay
- Fanglomerate
- Poorly to well-layered gravel, sand, silt and clay
- Narrabundah Ashstone Member
- Canberra Formation: Undivided sedimentary rocks
- Canberra Formation: Siltstone
- Canberra Formation: Mudstone

Note: a bar over a unit symbol indicates that the mapped unit has a cover of soil

Source: Henderson, G.A.M., 1986, Central Canberra 1:10,000 Engineering Geology Sheet

Client
Major Projects Canberra

Job Title
Canberra Rectangular Stadium Technical Site Analysis

Figure Title
Geological Map (1:10,000) for Civic Site

Scale at A4
1:10,000

Figure Status
Preliminary

Coordinate System
GDA 1994 MGA Zone 55

Job No	Figure No
274505-00	001

Issue	Date	By	Chkd	Appd
D1	27/04/2020	LJ	MLW	MLW

ARUP

Arup, Level 4, 10 Moore Street
Canberra, ACT, 2600
Tel +61 (02) 6191 7700
www.arup.com

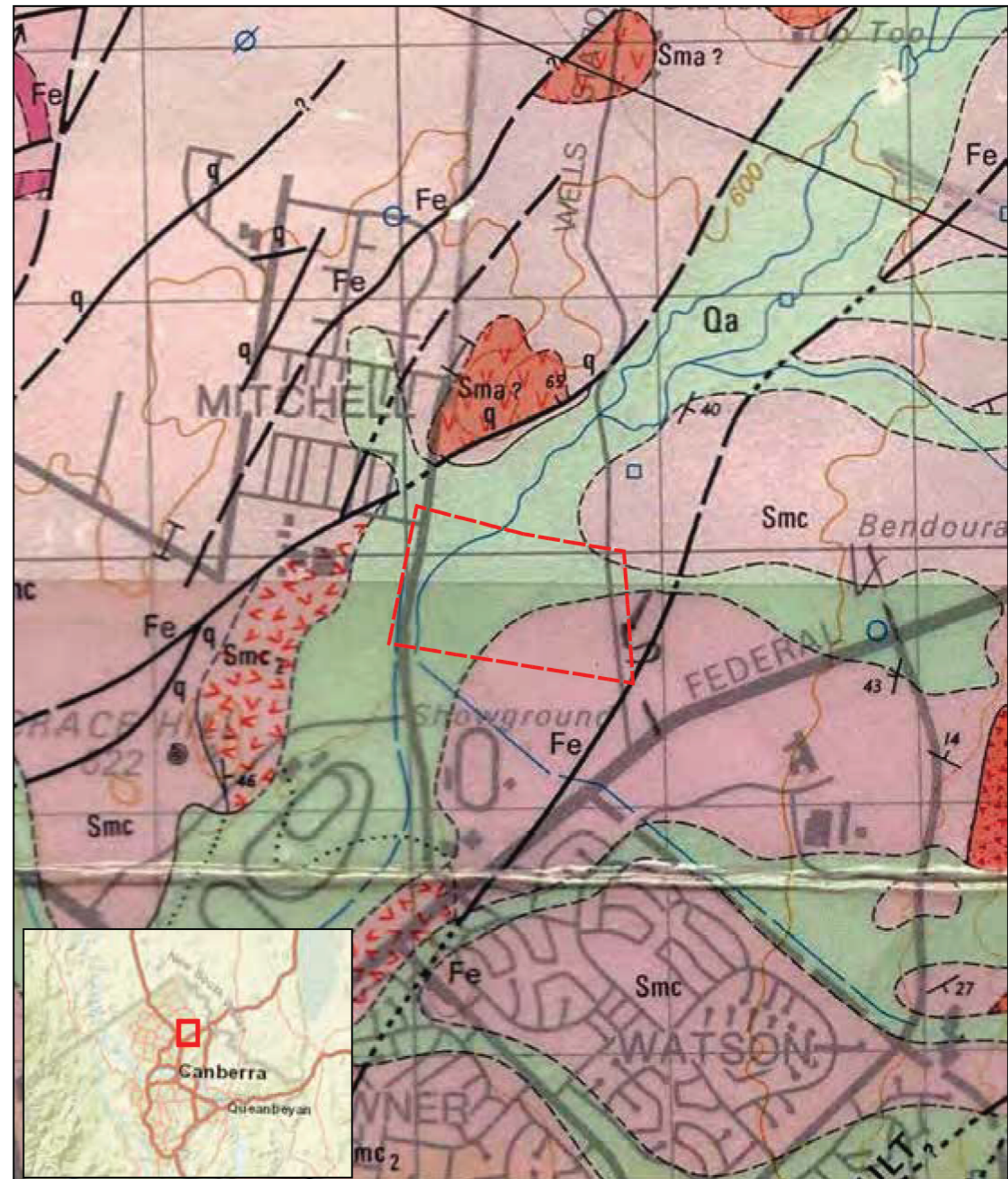
Scale at A4
1:10,000

Figure Status
Preliminary

Coordinate System
GDA 1994 MGA Zone 55

Job No
274505-00

Figure No
001



Legend

- Epic Site Boundary
- Alluvium, Colluvium (Qa)
- Ainslie Volcanics (Sma)
- Canberra Formation (Smc)
- Canberra Formation (Smc₂)

Source: Henderson, G.A.M., 1981, Canberra Queanbeyan and Environs. Scale 1:50,000

Client
Major Projects Canberra

Job Title
Canberra Rectangular Stadium Technical Site Analysis

Figure Title
Geological Map (1:50,000) for Epic Site

Scale at A4
1:20,000

Figure Status
Preliminary

Coordinate System
GDA 1994 MGA Zone 55

Job No	Figure No
274505-00	002

Issue	Date	By	Chkd	Appd
D1	27/04/2020	LJ	MLW	MLW

ARUP

Arup, Level 4, 10 Moore Street
Canberra, ACT, 2600
Tel +61 (02) 6191 7700
www.arup.com

Scale at A4
1:20,000

Figure Status
Preliminary

Coordinate System
GDA 1994 MGA Zone 55

Job No
274505-00

Figure No
002

B

Appendix B

Block Detail Reports



District Name **CANBERRA CENTRAL**

Division Name **CITY**

Block No. **1**

Section No. **62**

Block Key **11080620001**

Life Cycle Stage **APPROVED**

Volume and Folio

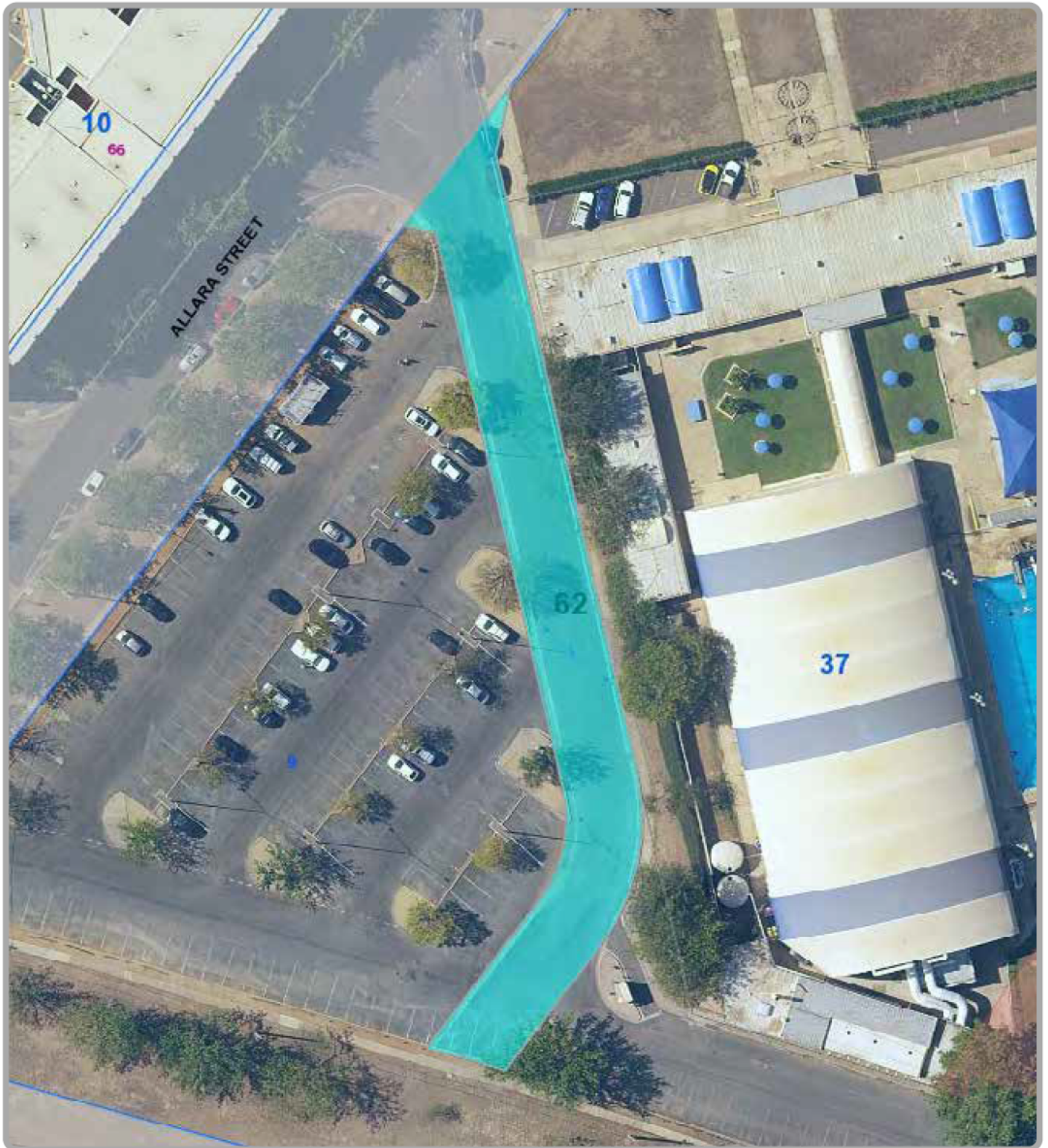
*Block Derived Area
(m²)* **1,236**

Address

Plan Numbers **AP110, POL4519**

*Territory Plan-
Land Use Zone* **DES: DESIGNATED**

*Territory Plan-
Overlay Zone*



District Name **CANBERRA CENTRAL**

Division Name **CITY**

Block No. **5**

Section No. **37**

Block Key 11080370005

Life Cycle Stage APPROVED

Volume and Folio

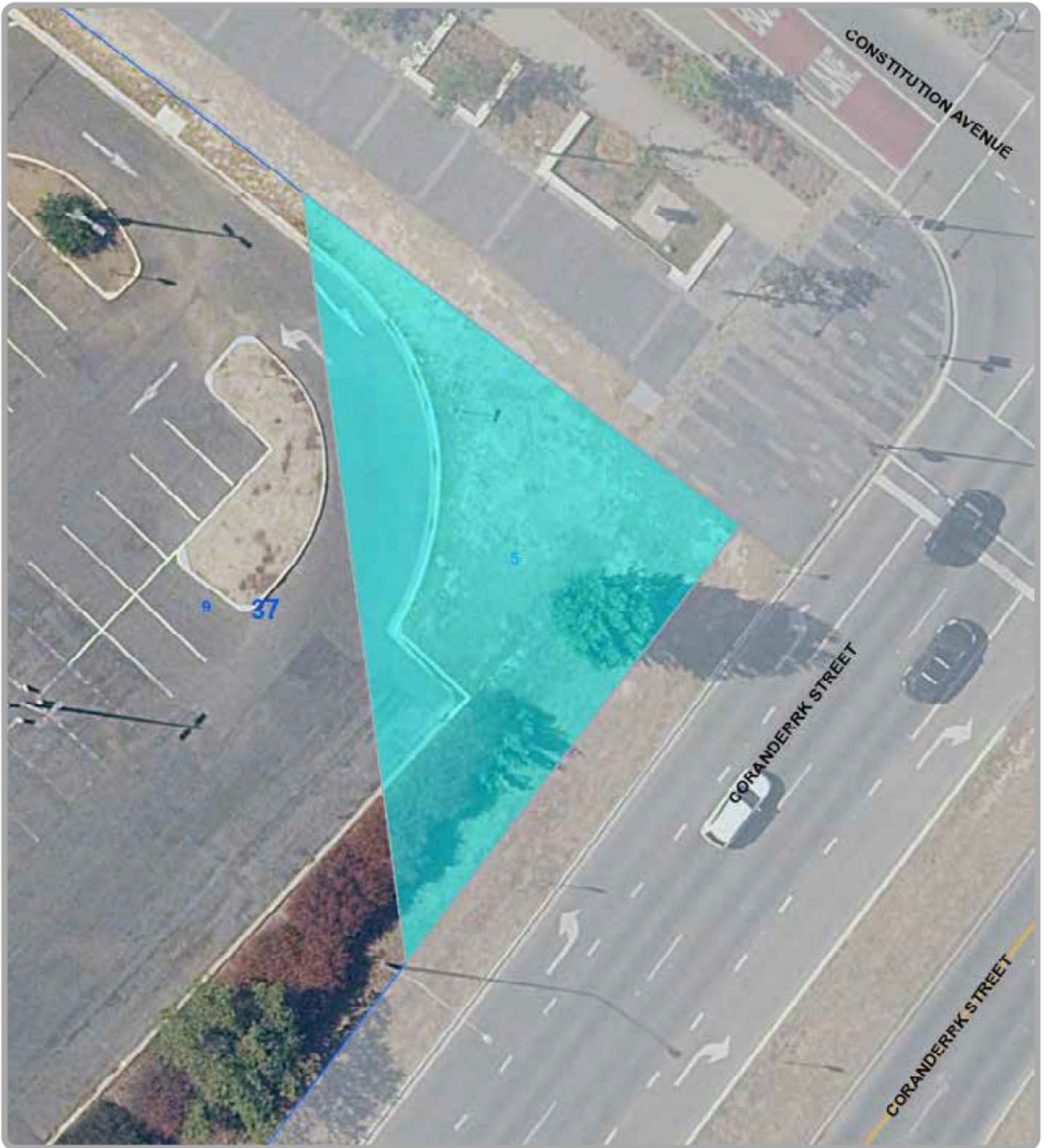
Block Derived Area (m²) 450

Address

Plan Numbers AP2661, POL4519

Territory Plan-Land Use Zone DES: DESIGNATED

Territory Plan-Overlay Zone



District Name **CANBERRA CENTRAL**

Division Name **CITY**

Block No. **7**

Section No. **37**

Block Key 11080370007

Life Cycle Stage REGISTERED

Volume and Folio 2094:22

Block Derived Area
(m²) 20,588

Address 36 CONSTITUTION AVENUE

Plan Numbers AP6885, POL4900, X20288, DP11080

Territory Plan-
Land Use Zone DES: DESIGNATED

Territory Plan-
Overlay Zone Pi: Sport and recreation reserve.;
PUBLAN: Public Land



District Name **CANBERRA CENTRAL**

Division Name **CITY**

Block No. **9**

Section No. **37**

Block Key 11080370009

Life Cycle Stage APPROVED

Volume and Folio

Block Derived Area (m²) 24,327

Address

Plan Numbers AP7354, POL4900

Territory Plan-Land Use Zone DES: DESIGNATED

Territory Plan-Overlay Zone Pi: Sport and recreation reserve.;
PUBLAN: Public Land



District Name **CANBERRA CENTRAL**

Division Name **LYNEHAM**

Block No. **6**

Section No. **72**

Block Key 11010720006

Life Cycle Stage REGISTERED

Volume and Folio 2211:25

Block Derived Area
(m²) 224,578

Address 10 FLEMINGTON ROAD

Plan Numbers AP7121, POL4900, X20835, DP11369

Territory Plan-
Land Use Zone NUZ1: BROADACRE

Territory Plan-
Overlay Zone



District Name **GUNGAHLIN**

Division Name **ISABELLA PLAINS**

Block No. **466**

Section No. **999**

Block Key 70000000466

Life Cycle Stage REGISTERED

Volume and Folio 2211:25

Block Derived Area
(m²) 181,616

Address FEDERAL HIGHWAY

Plan Numbers AP4062, POL4172, X20792, DP11366

Territory Plan-
Land Use Zone NUZ1: BROADACRE

Territory Plan-
Overlay Zone



District Name **GUNGAHLIN**

Division Name **ISABELLA PLAINS**

Block No. **765**

Section No. **999**

Block Key 70000000765

Life Cycle Stage REGISTERED

Volume and Folio 1986:24

Block Derived Area
(m²) 299,171

Address 50 MORISSET ROAD

Plan Numbers AP6176, POL4900, X18475, DP10842

Territory Plan-
Land Use Zone NUZ1: BROADACRE

Territory Plan-
Overlay Zone



District Name **GUNGAHLIN**

Division Name **ISABELLA PLAINS**

Block No. **864**

Section No. **999**

Block Key 70000000864

Life Cycle Stage APPROVED

Volume and Folio

Block Derived Area (m²) 105,074

Address

Plan Numbers AP7487, POL4900

Territory Plan-Land Use Zone NUZ1: BROADACRE; TSZ1: TRANSPORT

Territory Plan-Overlay Zone



C

Appendix C

Implementation Program

AS WELL AS
FRESH BREWED COFFEE



Prepared for

Major Projects Canberra

Major Projects Canberra

Callam Offices

60 Easty Street, PHILLIP ACT 2606

Prepared by

Arup

Suite 4.04 Level 4

10 Moore Street

Canberra ACT 2600

GPO Box 578

Canberra ACT 2601

Australia

www.arup.com

ARUP

POPULOUS
WT PARTNERSHIP

